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'23

SHOWDAILY

TUESDAY
NOVEMBER 28, 2023

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Published by **NTSA**

US Air Force Looks to Expanded Training Capabilities

The US Air Force is utilizing several opportunities during I/ITSEC 2023 to highlight a range of expanded training capabilities.

According to US Air Force Service Executive Colonel Matt "T2" Ryan, USAF, Senior Materiel Leader, Simulators Division, many of the expanded capabilities are addressing two "heavy hitter" programs: Simulator Common Architecture Requirements and Standards (SCARS) and Joint Simulation Environment (JSE).

"There is a lot of activity happening there," he began. "With SCARS, for example, we're continuing on the path where we're still fielding our 'On Premise Equipment' to new sites and working to stand up additional security operations centers that would give us the ability to operate at multiple classification levels. Today, we're only operating at the unclassified level. But in the future, we'll be operating across the classification levels."

Ryan highlighted some of the key "high-level objectives" in SCARS, including affordability, cyber security and interoperability.

"The first objective calls for affordable, concurrent and interoperable training systems that are able to leverage common applications," he explained. " One of the big objectives from SCARS is a cyber secure training system. Many of our training systems were developed decades ago, and a lot has changed with regard to the cybersecurity mission over those last couple of decades. And that has very significant implications for how we can use those systems and how they can interoperate with one another."

He added, "And then the other piece coming back to that interoperation is how we ensure that when we are interoperating for distributed training, we are having a fair fight between our operators as they train together across different mission design series."

He said that the current program status includes ongoing work with the SCARS vendor and Air Force Research Lab, where focus efforts involve improving virtualization capabilities, in particular with the F-16, to show that SCARS can support real-time simulation.

"Another one of the big keys with SCARS is that it allows us to really break down a lot of the tight coupling between the hardware and these models, which allows us to break vendor lock," he continued. "So now, as I move ahead and prove out this capability, I can really modularize things. Now I can go and compete components. In a simple use case, let's say I want to replace the model for the radio for whatever reason. I don't have to recompete the entire model of the whole airplane. I just go compete that one piece of it, working with multiple vendors who may be
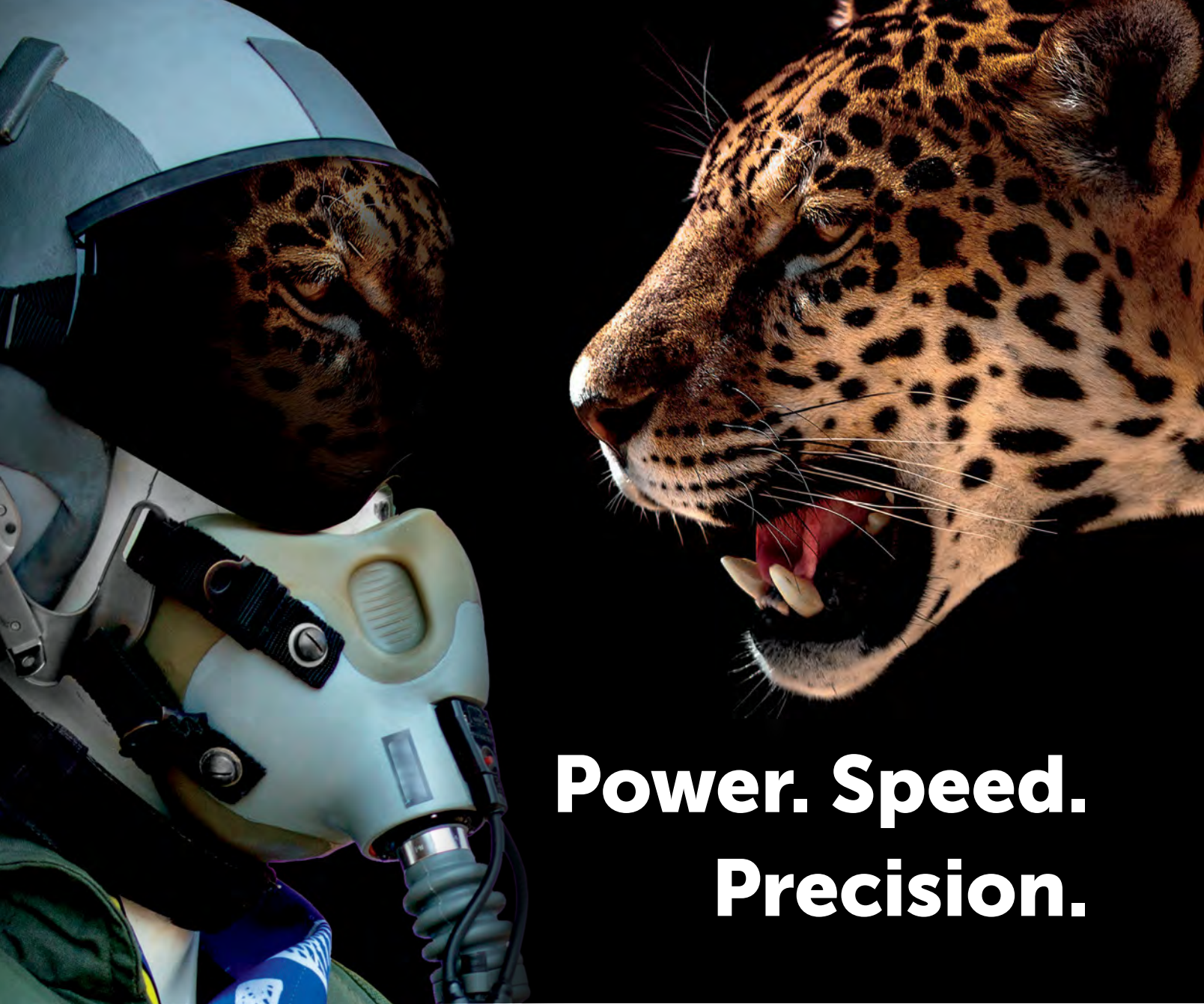
TUESDAY, NOVEMBER 28
CONFERENCE HIGHLIGHTS

REGISTRATION HOURS
0700-1800 *(West Concourse)*

0730-1600 *(Satellite Registration - Hyatt Regency Main Lobby)*

OPENING CEREMONIES
0815-1000 *(Hyatt Windermere Ballroom)*

Including Conference Chair Opening Remarks, Fireside Chat with U.S. Army Senior Leaders and Industry Keynote

EXHIBIT HALL HOURS
1200-1830

1700-1830 **Exhibitor Networking Event**

SIGNATURE EVENTS
1030-1200 **Senior Leader Panel** *(Hyatt Windermere Ballroom)*

1400-1530 **Army General Officer Panel** *(Room W304CDGH)*

1600-1730 **How the Marine Corps is Using the Digital World to Support Training Today and Into the Future** *(Room W306AB)*

1600-1730 **Department of the Air Force General Officer Panel** *(Room W304CDGH)*

1600-1730 **Joint & Multi-National Constructive Training Exercises** *(Room W304EF)*

1600-1730 **DoD's Real World Digital Twins** *(Room W304AB)*

FOCUS EVENTS
1400-1530 **Fast-Tracking DoD's Test Capability Development: Connecting the I/ITSEC Community** *(Room W304EF)*

1400-1530 **Human-Centered Successes and Challenges in AR/VR Development and Implementation** *(Room W306AB)*

1400-1530 **Best from Around the Globe** *(Room W305AB)*

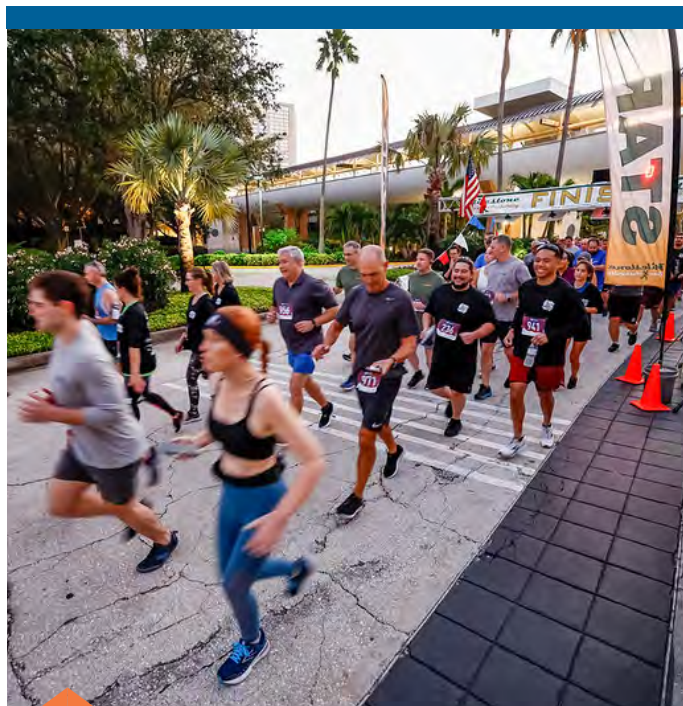### COMMUNITY OF INTEREST
1200-1830 **Serious Games Showcase and Challenge** *(Exhibit Hall Booth 3181)*

PAPER SESSIONS
(Download the I/ITSEC app for synopses)

1400-1530 *(Rooms W300 – Theatre; W307ABCD; W308AB)*

1600-1730 *(Rooms W300 – Theatre; W307AB; W308AB)*

SHOWDAILY

Annual 5K Event Supports Tunnel to Towers and STEM at I/ITSEC

The Annual I/ITSEC 5K Run/Walk/Roll will occur Wednesday, November 29. The event begins at 0630 in front of the OCCC West Concourse, Hall D. Packet pickup opens at 0530.

The event supports the Tunnel to Towers Foundation and the NTSA EcosySTEM of Learning at I/ITSEC.

Tunnel to Towers is an organization that since 9/11 has been helping 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. The foundation also works to eradicate veteran homelessness and aid the victims of major US disasters.

The NTSA EcosySTEM of Learning at I/ITSEC focuses on strategically and tactically building interest and educational momentum through a wide breadth of science, technology, engineering and mathematics (STEM) initiatives to establish, nourish and maintain a solid foundation for launching future leaders and fostering the future workforce.

Start the day bright and early and join the I/ITSEC community in supporting these causes!

Congressional Panel Kicks Off I/ITSEC 2023

As the first Special Event of I/ITSEC 2023, members of the Congressional Modeling and Simulation Caucus shared messages and learned about some of the latest technologies in modeling and simulation. Founded in 2005, the purpose of the Caucus is to strengthen the industry by growing capabilities through education and legislation.

NTSA strategic planning director, Linda Brent, PhD, opened the Monday morning panel, which included Congressman Bobby Scott (VA-03), Congressman Jack Bergman (MI-01) and Congressman Darren Soto (FL-09).

"NTSA supports several events during the year in collaboration with the Caucus to achieve its mission," she began. "Admiral Robb cared deeply about growing our industry. And as such, we continue to work closely with the Caucus to advocate the strength of technology to improve human performance, save lives and save money."

After describing the caucus, she offered, "So why are we here? And why is the Caucus here? And why is it important? Well, as you know, a significant amount of the sales in this industry are from government agencies and organizations, from the Department of Defense and just about every other government agency. So this event is our opportunity to learn firsthand about the issues that are important to our representatives and their constituents."

Brent continued, "We know modeling and simulation. We know how it can solve problems. By learning about the issues our nation faces from our leaders, we can determine ways our technology can solve those problems. This helps them to determine, as well, the matches between the country's needs and what technology solves."

She introduced Congressman Bobby Scott, who co-founded the Congressional Caucus in 2005 with Congressman Randy Forbes "with the express intent to remain bipartisan, which it does to this day," characterizing him as "a stalwart supporter of this industry."

Scott offered that his district "has a lot of interest in modeling and simulation, citing extensive applications at places ranging from the Virginia Modeling Analysis Simulation Center at Old Dominion University to Newport News Shipyard, "where they are designing and building major ships, aircraft carriers and submarines using modeling and simula-

tion that not only does it more efficiently, but also saves a lot of money. And that is not lost on Congress when you can do something better and cheaper."

Scott pointed to multiple government infrastructure programs, emphasizing that Congress has been trying to insert modeling and simulation language any time that it can.

As one example, he offered, "One initiative we had last year — we got it passed in the House, not the Senate — was the Apprenticeship Act, which would provide a million new apprenticeship opportunities and expand the sectors that you could use apprenticeships for, not just the traditional trades, but also healthcare, finance and technology, making sure those jobs are available."

Congressman Soto began, "I want to thank all of you for what you do to help protect our troops, to help train them and to make sure that we have readiness — and also to save money. That is more relevant now or as relevant now as it ever has been, when you think about all the work we do in diplomacy to try to keep peace across the world. And yet every year, we're reminded that there are threats facing both America and our allies. We saw with the invasion by Russia of Ukraine, we see it again with the attack by Hamas on Israel. We see how important the work you do is. Every time our constituents read the paper, they read that we're sending humanitarian relief, we're sending military hardware and we're doing training. We know that's what you all are doing."

Congressman Bergman opened with his memory of Admiral James Robb, president of NTSA. Describing him as "an innovator and a visionary," he said, "I've never seen a more relaxed and budget-focused leader than Admiral Robb as I got to know him over the past few years. And when you think about his time in naval aviation, he went from an environment where there was no simulation training to embracing the future."

Bergman shared what he called his "Five 'I's," which he uses as guideposts in interactions and decision making, identifying Integrity, Intent, Innovation, Initiative and Intensity.

"When you apply those 'five Is' to what we're trying to do here, I believe that the challenge that we have as members of Congress is to ensure that we don't overburden you as innovators with unnecessary hoops to jump through, and those are largely from bureaucracies [because] their job is to create hoops."

Following their brief prepared comments, the three Congressman addressed questions from the audience, ranging from recommendations for balancing the building of service-specific silos of excellence with the demands for joint operability to how they see the future of artificial intelligence, including associated risks to national security.
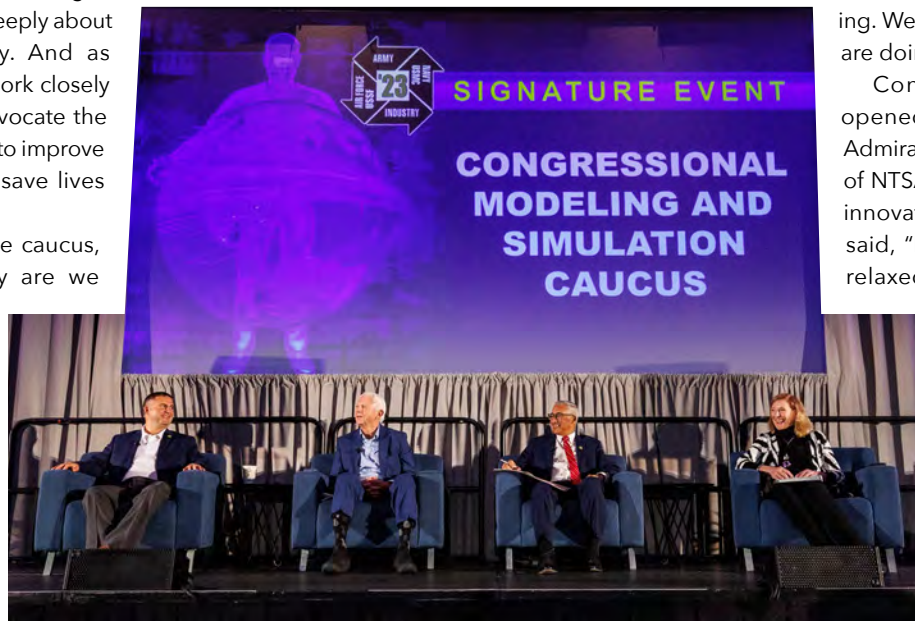
Conference Chair Highlights Continuing Growth

In his personal preview of I/ITSEC 2023, Conference Chair Eliot Winer, PhD, reflected on the recent growth of the annual event.

"**W**hen we look back two years ago, when I was I/ITSEC Program Chair, COVID was on the minds of many people and we had no idea what the attendance was going to be," he began. "We thought we might have 10,000 attendees that year, but we were well over that; I think we were close to 14,000 people. And then last year was just huge! So now it's like everybody wants to get back to in-person events. And so, as we came into this year, we had this realization that this is growing. People are excited. We realized that we needed to prepare for the possibility that we could be over 20,000 – bigger than we've ever been before. And preparing for that possibility included the fact that we had to have a program appropriate to that size."

He said that the first steps of that program were actually taken more than a year ago, when I/ITSEC planners met with representatives from the 2023 "lead service" to develop a relevant conference theme.

"The lead service changes each year," he explained. "This year it is the US Army. And we learned very quickly that the service principal, Ms. Karen Saunders, Program Executive Officer for Simulation, Training and Instrumentation, was going to be really, really engaged. And her team was closely involved from 'Day One,' which was phenomenal."

He continued, "Our Program Chair, Anne Little, started meeting with them in April or May of 2022. And this is in planning for a conference in November of 2023. And the Army was so enthusiastic from the beginning, which has driven a lot and kept everyone energized and excited. The Army is truly leading the way and doing a phenomenal job!"

He observed that a key part of that effort has focused on the Army working with the other services to highlight joint service issues and opportunities.

"There is a tremendous effort from across the joint services this year," Winer asserted. "Things like joint special events and panels are going to enrich the experience for attendees. They are going to see the services working together, presenting technologies, solutions and methods in joint environments, as opposed to 'Here's my little item that works in my corner of the world.' Couple that with the amazing efforts and support from everyone at NTSA. Additionally, the Office of Secretary of Defense has been much more active this year than I have seen in previous years. The fact is, whenever something needed to be done, multiple people jumped in to get it done."

He said that the new result was an increase in program offerings, while acknowledging that those expanded offerings came with unique program development challenges of designing a program to appeal to such a broad audience.

Asked about any messages for first time I/ITSEC attendees, Winer acknowledged what he called his "unique background perspective" as an academic, offering, "Just about every year I bring new students as new attendees to the conference. I try and prepare them by telling them that this is unlike anything else you are going to see. I tell them that there are more offerings here than they can possibly imagine. I tell them that they could spend two days walking the show floor and never even see the papers, tutorials, workshops or special events. And every single year, they come back with wide eyes and say that they couldn't believe how big this was and how much stuff is going on here."

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He added that such universal first-time visitor experiences contributed to this year's introduction of curated personas and sample agendas [https://www.iitsec.org/agenda/agenda-overview/personasagenda].

"Certainly the personas won't be identical to everyone's individual positions," he said. "But they might be close. As an example, the industry persona, working as a program manager, might have an interest in high level content related to DoD trends. Or someone working in business development might want to meet leaders in DoD and industry and identify collaboration opportunities. So we have a whole list of these notional persona under categories like industry, government and academia. And an attendee who identifies with one of the persona can go to a sample agenda that includes a combination of tutorials, special events, papers and workshops. And they can use that as a starting point for their visit."

Winer's second bit of advice involved seeing as much as possible.

"Don't just do a cursory look across stuff," he said. "For example, I could see an academic saying, 'Well, I'm just going for the papers. I don't need to go on the show floor, since the

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EVERYTHING SO YOU CAN
BE READY FOR ANYTHING.

ENSURING THOSE WE SERVE ALWAYS STAY
AHEAD OF READY

LOCKHEED MARTIN

Conference Chair ... *continued from p6*

technology exhibitors are really not important to me.' No. That's wrong. Trust me. People have these preconceived notions in their head about content delivery methods. But they are always surprised when they attend something and realize that not only did they get something unexpected out of it, but they can use that in their career."

He pointed to the example of Serious Games Showcase & Challenge, adding, "That's a wonderful thing that we do every year. It highlights games from individuals and companies with different award categories. Some people just think that it's just a competitive technology demonstration. But I send people over there every single year and they come back with the exclamation, 'Oh my goodness, I never thought to apply this technology to that problem.' All of a sudden, their mind is churning with applications to their job. And who would have thought that they have gotten that idea by looking at serious games?"

Winer closed with a broader challenge to all I/ITSEC attendees, urging them to "Be part of the solution."

He explained, "A lot of times attendees come to I/ITSEC and say they are academics, or from a gaming company. They have great technology

> " ...freedom comes at a price and that affects us all. And perhaps what you do could address a challenge that is facing others.

but they don't feel involved with supporting first responders or warfighters. Actually it's very natural to think, 'That's not me. We don't do that.' None of the service principals I have ever met want conflict. They are trained for it, because of the world we live in. Perhaps that's a reality that a lot of people don't want to face. But freedom comes at a price and that affects us all. And perhaps what you do could address a challenge that is facing others. And if all of us are part of that solution to help readiness, it gets easier, it gets more cost-effective and it gets easier for our men and women on the front lines."

Winer concluded, "One more thing. Take advantage of all of I/ITSEC. In addition to the exhibits, tutorials, papers and special events, keep in mind that this is not a conference that only runs nine-to-five. There are social activities going on many nights with networking opportunities. So walk the show floor. Go to the presentations. But also go to the social events. And seek out people you haven't met before, because it is often those personal connections that drive forward to future solutions."

DON'T MISS THIS MORNING'S OPENING CEREMONIES

[0815-1000, Hyatt Windermere Ballroom]

The event includes opening remarks by 2023 I/ITSEC Conference Chair Eliot Winer, PhD; the US Army Fireside Chat with the Honorable Douglas R. Bush, Assistant Secretary of the Army (Acquisition, Logistics, and Technology) and General Gary M. Brito, USA, Commanding General, US Army Training and Doctrine Command (TRADOC); and the Industry Keynote by Doug A. Bowman, PhD, Frank J. Maher Professor of Computer Science, Virginia Tech.

I/ITSEC 2023 and NTSA Welcome New Exhibitors!

A warm welcome to the exhibitors who are either new to I/ITSEC this year or are returning after a hiatus.

HigherEchelon, Inc. [449]
Rendered.ai [2343]
REALTIMEVISUAL [2521]
Adaptive Immersion Technologies [425]
Inhance Digital Corporation [549]
TReX II (Training & Readiness Accelerator II) [762]
DoD ATEA [2681]
Scope AR [2236]
North American Wave Engine Corporation [715]
SOSSEC, Inc. [3306]
Obsidian Solutions Group, LLC [2339]
Department of Homeland Security, Science & Technology Directorate [1728]
Dogfight Boss [2864]
Viasat [3225]
Defense Acquisition University [3231]
Parallax Labs [671]
dSPACE Inc. [3207]
Dynamic Graphics, Inc. [3649]
Entrenadores Olarte [3159]
Federal Compass [3460]
Sterling [3330]
Dataunitor AS [439]
Naviworks Co., Ltd. [3261]
X2O Media [3419]
ZEN TECHNOLOGIES USA INC [3058]
ForgeFX Simulations [3464]
GUARDIARIS d.o.o. [3119]
Fynd Reality AS [3229]

YUAN High-Tech Development Co., Ltd. [673]
Intel [3326]
Parker Group, Inc. [465]
ADS, INC [2666]
Unanet [3205]
Trek10 [3227]
Blackwood [861]
Holo-Light USA, Inc. [3575 & MR291]
Learn to Win [3406]
Case Western Reserve University [3400]
Real Response [2958]
ArborXR [3302]
All Points Logistics [3304]
Intelligent Ultrasound North America, Inc. [2341]
Vector Solutions [3305]
Battle Road Digital, Inc. [2884]
Staco Systems [865]
Clear Science, Inc. [3774]
USEncryption [3673]
AgileView Inc [3363]
WEART Srl [3511]
Gigantor Technologies [3768]
Nakamir [866]
G&D North America Inc. [2683]
Threat Tec [553]
Scenario Trainer Inc [3770]
Werco Manufacturing, Inc. [MR-187]
Zuleris Interactive LLC [3772]
Lynx Mixed Reality [328]
Moodle [334]

iQ3Connect [3674]
Omni Federal [763]
Craftsmen Industries [570]
huensoft [674]
FedLearn [3515]
Sliger Designs LLC [670]
Team Orlando STEM (USA, USAF, USN) [3392]
Kent State University College of Aeronautics and Engineering [520]
Pluralsight [764]
Western Governors University [3614]
Xiphos Partners [1207]
CYBER RANGES Corp. [2985]
Lit Thinking [3639]
Dauntless XR [3668]
Defense Contract Audit Agency [332]
ITI Engineering [3429]
iPerformX LLC [155]
IntelliBoard [432]
Wescom Defence [3629]
UCF STEM Aviation Showcase [3295]
GameDriver [3730]
A Square Games and Simulation, LLC [3402]
Grid Raster Inc. [3471]
Campfire 3D Inc. [3571]
Landing Zones Canada [573]
Operator XR [1227]
Mediterranean Linguistic Services [473]
Intrepid Control Systems, Inc. [672]

Career Fair Brings Opportunities

The NTSA Career Fair at I/ITSEC 2023 [Wednesday, November 29, 1300-1700, Room W110A] provides a forum to link top talent with industry and government organizations. New graduates and transitioning professionals can network and learn about possibilities in the fast-growing modeling, simulation and training community.

Tutorial Provides Introduction to Defense Modeling and Simulation

The vast offerings at I/ITSEC 2023 include more than 30 Tutorials covering an expansive array of modeling and simulation (M&S) topics.

One of Monday's Tutorial sessions, Introduction to Defense Modeling and Simulation, presented attendees with an overview of the fundamental technologies, terms and concepts regarding M&S as used in the Department of Defense (DoD).

The presenters were John Daly, chief engineer at Booz Allen Hamilton, and James Coolahan, PhD, Coolahan Associates, LLC.

Daly began the well-attended session with a question. "How many folks are here at I/ITSEC for the first time?" he asked, with many raised hands in response. "This is geared a little more to first timers, but there's information in here that I think is applicable to whether it's your first time or the 100th time you've been here," adding that the goal is to provide information "so when you walk around the exhibit hall or attend other tutorials and presentations, you understand some of the lexicon in context."

He described the learning objectives: to explain the scope and fundamental terms and concepts associated with defense M&S; identify key policies and procedures for US DoD M&S; summarize key defense activities enabled by M&S; and discover some defense M&S information resources.

Coolahan continued the session with discussion of M&S terms and definitions, why we would want to model or simulate, and what types of models and simulations we find in defense use.

"So why would we want to model or simulate?" he said. "First there's the question of affordability. There's always concern about cost. We can simulate operations and processes and that lets us determine what might be the most cost-effective option." He described feasibility and safety as well as research and development as other reasons.

Coolahan described live, virtual and constructive simulations with definitions and examples of each. "A live simulation is a simulation involving real people operating a real system," he said. "A virtual simulation is a simulation involving real people operating simulated systems. So, if you go out on the show floor, you'll see lots of simulators related to aircraft, driving simulators, where you have an individual sitting in a representation of a system, but it's a real person… And constructive is simulation that involves simulated people operating simulators."

Following Coolahan's discussion of the terms "resolution, aggregation and fidelity," Daly continued the session with, among other topics, descriptions of US DoD distributed simulation architectures, the verification, validation and accreditation process including considerations regarding artificial intelligence, and available resources for more information.

Prior to audience questions, Daly said, "What we're hoping you got out of this was the scope and fundamental terms and concepts associated with defense modeling and simulation - at least you got a 'fire hose' of it."

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MVRsimulation Introduces Mixed Reality Sand Table

MVRsimulation [Booth 1019] is utilizing I/ITSEC 2023 to introduce its new mixed reality sand table, that provides a shared 3-D visualization tool for realistic geospecific mission planning/rehearsal, classroom-deployed tactics training, real-world mission planning and after-action review (AARs). The mixed-reality sand table, which will be integrated with several other company products in the booth, allows commanders, instructors, trainees and students to interactively plan and review training missions in a collaborative, mixed-reality setting.

According to Garth Smith, president of MVRsimulation, traditional military sand tables consist of 2-D maps, aerial photographs or sand molded into 3-D representations of terrain. Tokens are then placed on that sand table terrain to represent friendly and enemy forces ahead of military actions.

"I think there's a general awareness that the sand table is an important thing," Smith said. "And it's funny when you see them in old pictures. If you type in sand table, military, practically every image is with physical sand and with cups, straws, sticks and other items representing things like vehicles. A lot of those sand tables were done in the analog world, and I think some of us have just realized that the sand table needed to migrate to mixed reality."

As a result, the MVRsimulation sand table replaces that physical system with a mixed-reality 3-D 'table' upon which the virtual battlespace is rendered by the company's Virtual Reality Scene Generator (VRSG), a Microsoft DirectX-based render engine that provides geospecific simulation as an image generator with game quality graphics, in its geospecific, round-earth 3-D format. It allows users to plan, enact and review training scenarios while directly interacting with cultural objects in VRSG or by the use of any DIS-based Semi-Automated Forces commercial or government off-the-shelf software.

Users are immersed in the virtual sand table through the use of Varjo mixed reality headsets, which allow the user to freely explore the 3-D visualization of the terrain. The

design not only allows for direct interaction with other observers in the real world, but also permits users to operate physical emulated real-world military equipment like the Android Team Awareness Kit (ATAK).

Members of the development team at MVRsimulation said that the idea for the mixed reality sand table emerged from discussions with the military Joint Tactical Air Controller (JTAC) community, with individuals indicating that they would like to have an additional ability for after action review and evaluation in a 3-D environment.

Smith noted that the sand table was subsequently developed "over six or seven months" with development internally funded by the company.

"Developments are always internally funded by our company," he said. "We don't do labor contracts and we don't take contracts for development. So it's all internally developed, internally funded."

Smith added that the presence of the mixed reality sand table at I/ITSEC "will highlight the company's overarching connecting capability" with other elements at the booth, including pilot pod stations and the company's mobile classroom containing MVRsimulation's mixed-reality Deployable Joint Fires Trainer (DJFT).

He highlighted the fact that DJFT achieved full accreditation by the Joint Fire Support Executive Steering Committee in August of this year, adding that the milestone makes the DJFT the first accredited mixed-reality JTAC training device that can be used to log controls that would otherwise need to be carried out in a live training environment.

He added that the terrain database in the sand table is "shockingly gorgeous" in terms

of quality of detail.

Smith said that another capability that will be highlighted in the booth scenarios will be the company's 3-D entity models of vehicles.

"Because we are software flexible, we could generate a topical scenario fairly quickly," he explained. "So the scenario in our terrain model is going to feature the most current Iranian vehicles, and in particular, it's going to feature a short range Iranian ballistic missile launcher, together with various anti-air and radar platforms like the Soroush radar. If you try to look up computer models of these systems it's likely that our company is the only company that has what we're showing. We want to show how relevant our software is, where you can go and get representations of vehicles that you read about in the current press."

He also described how the terrain models allowed visualizing the vehicles "in a meaningful way for Soldiers," such as whether a particular missile launcher was elevated or had its stabilizer pads down on the ground, indicating potential for launch.

"Many of the vehicles used in the scenario are extremely esoteric," he acknowledged. "They're unusual, but they represent just part of our normal 3-D entity model library built out. So we have some really interesting looking vehicles as part of the scenario, which is extremely current based on what we just read in the news, and we added some additional vehicles to the scenario to make it even more compelling to see just how extensive our model library is."

Asked about anticipated program activities with the mixed reality sand table over the coming year, Smith offered, "We try to build things that people ask for, then we put them out there and try to demonstrate what we're able to do. And sales have traditionally followed. That's a very different business model than other companies…We try to be very pure about how we do our development. We will build a simulator based on what the warfighter says they want or need. Then we will get it out in the community and show it to people to try to get an early adopter and then get traction that way."

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Exhibitor Networking Event
[Exhibit Hall – 1700-1830]

Be sure to kick off I/ITSEC 2023 with a stop by one of the participating booths at the I/ITSEC Exhibitor Networking Event. This is a great way to view the latest technology, while networking with exhibitors and your fellow attendees. Be sure to check the official I/ITSEC website and onsite signage for updated hospitality participants.

BOOTH	COMPANY NAME	OFFERING
312	HOLOGATE/HGXR	Beer in beer mugs
549	INHANCE DIGITAL	Beer, wine, sodas, water and snacks
572	IT²EC	Heineken Beer
601	YORKTOWN SYSTEMS GROUP	Beer, wine and pretzels
1071	BOHEMIA INTERACTIVE SIMULATIONS	Beers from around the world
1481	METRIS GLOBAL	Foreign & domestic beers and light appetizers
1706	SCALABLE DISPLAY TECHNOLOGIES INC.	Calibrate your taste buds and join us for beer and wine. See a Scalable or Electric Picture Staff for tickets.
2548	BARCO, INC.	Beer (Stella Artois, Leffe Blonde and Hoegaarden) and popcorn
2673	INGALLS INFORMATION SECURITY	Beignets and sweet tea
2800	MASS VIRTUAL	Full-service bar with ultra-premium spirits, wine and beer
2848	RUDDY NICE LTD	Join us for British gin o'clock, French Champagne and crafty beer.

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Metris Global Focuses on Human Performance

The I/ITSEC 2023 spotlight will shift to the topic of human performance later today when Metris Global LLC [Booth 1481] participates in a panel discussion in the Innovation Showcase titled "Why an advanced, agile approach to Human Performance is necessary to keep pace with modernization mandates" [1430-1530, Booth 2588]. With a secondary theme exploring the importance of keeping pace with training process innovation even in cost constrained environments, the panel will look beyond the fielding of next generation technologies to address how warfighters can adapt and adopt to maximize the training benefits of those technologies.

According to Tony Barker, former Chief of Operations for the US Border Patrol and current chief operating officer of Metris Global, the panel discussion will provide "an opportunity to 'level set' how critical human performance technologies and training still are to personnel – in addition to the new/advanced products being introduced – in an often fiscally restricted environment.

The panel moderator will be Timothy Haws, director of human performance technology for Metris Global LLC, with attendees including Barker as well as: Thomas Heckens, former Non-Commissioned Officer with 5th Group Special Forces and founder / chief executive officer of Metris Global); Julie Farnam, former Deputy Director of Intelligence for the US Capitol Police (during the January 6 events at the Capitol); and Timothy Robbins, former acting Director, Enforcement & Removal Operations, Immigration and Customs Enforcement.

"We have amazing technologies that are provided to servicemen and women in order to increase survivability, safety and operational efficiency," Barker explained. "The technology is great. But the training methodologies and the process management and how you introduce those technologies into operational situations with the human, the actual service member, needs to keep pace. Because if you're using 1975 training methodologies with 2030 technical capabilities, there's going

to be a disconnect and nobody is going to get the best out of it. That's why I think this is an extremely important conversation for the panel. It will include specific examples that the country is familiar with, that could have been different if there had been a better and more precise focus on training and processes."

Barker and moderator Haws both pointed to the value of human performance technology (HPT) and the significance of this afternoon's panel discussion in learning to avoid that potential disconnect between training technologies and training methodologies.

Haws described his own experience as a 26-year US Coast Guard officer with assignments "focused on the training world and human performance technology."

"I am passionate about HPT," he began. "I think it's a great model, but it is underutilized. When you look at the modernization mandates that are hitting the Department of Defense and US Government, they need something innovative. And I believe that HPT is going to ensure that we maximize the human training experience with all of these new technologies being brought on board...There's a lot happening with AI. There's a lot happening with distance learning. And with this panel, Metris has focused on things like the training needs associated with those modernization mandates against the societal shift to a much more mobile learning space. How does all of that equate across DoD and the US Government?"

Barker referenced his own experience with the US Customs and Border Protection and Department of Homeland Security, offering, "One of the things that I really think is extremely impressive was not only how Customs and Border Protection as a whole was reacting to the immigration or mass migration challenges that we're facing along the southwest border over multiple administrations, but also the pipeline of well-trained and qualified officers and agents to put out in the field, and the necessity to produce a highly qualified, highly trained officer and agent as fast as possible to fill those roles.

> **"** If you're using 1975 training methodologies with 2030 technical capabilities, there's going to be a disconnect and nobody is going to get the best out of it.

We have mandates for modernization. But those mandates are also on top of a fiscally restrained environment."

He added, "We need to look at how we train differently."

He described today's panel members as "a very eclectic collection of professionals that we are privileged to have," noting, "Tim Haws is one of the foremost experts on human per-formance and having him moderate this and be able to draw out those 'nuggets' from the panelists is going to be critical."

Reiterating his own experience as well as summarizing those of Metris CEO Tom Hop-kins, he continued, "Tim Robbins is the former Acting Director of Enforcement and Removal Operations for Immigration and Customs Enforcement (ICE). There are certain pres-sures with those operations, and making sure that the workforce is trained, equipped and doing what they need to do effectively within the rules of their SOPs [standard operating procedures] to enforce our nation's laws is so critical, especially with many eyes on them. So he is going to talk about how training is critical to the ICE mission, and especially in a fiscally constrictive environment as you get the polarization within that mission set.

"And the last panelist in our very eclec-tic group is Julie Farnham. And this will be the first time that Julie Farnham has spoken publicly with regards to her role during the January 6 [2021] events [at the US Capitol]. She was the Deputy Director of Intelligence for the Capitol police on that day. And I don't want to take her thunder away, but she will talk about how training is so critical to the intelligence and intelligence analysts, as well as some of the successes and failures and how lack of training and lack of prepared-ness resulted in some of those aspects of January 6. Again, this will be the first time she speaks publicly about that," he said.

In summarizing his takeaway message, Haws said, "Everybody knows that the Department of Defense and other US Gov-ernment organizations have modernization mandates. And one of the biggest parts of meeting those mandates is rising to the challenge of exponentially rapidly develop-ing technology. From AI to VR to XR, all of the 'realities' have to have the human at the center...And we need to look at ways that

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1 The DJFT is comprised of three two-person transportable aluminum cases: instructor operator, role player, and observer (JTAC) stations.

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Varjo Releases New XR-4 Series Mixed Reality Headsets

Varjo [Booth 1460] is utilizing I/ITSEC 2023 to debut its next generation XR-4 series headsets – XR-4, XR-4 Focal Edition and XR-4 Secure Edition. With the XR-4 series, Varjo is the first company to introduce gaze-directed, high-resolution autofocus cameras in mixed reality.

According to company representatives, through the fusion of its highest-resolution displays, foveated capture stream, advanced LiDAR depth sensing and camera sensors, all of which mimic the function of the human eye, the Varjo XR-4 series offers virtual and mixed reality experiences practically indistinguishable from natural sight.

"As we enter a period of rapid expansion in mixed reality adoption, we're proud to drive the industry forward by bridging the gap between human vision and computer vision with our new XR-4 series," said Patrick Wyatt, chief product officer of Varjo. "For the past five years, Varjo customers have demonstrated that true innovation happens when the most advanced computing power meets the highest-immersion XR in the hands of industrial users, and we can't wait to see the applications unlocked by the XR-4 series' technological breakthroughs."

Powered by NVIDIA GPUs and integrated into NVIDIA Omniverse, the XR-4 series allows developers and industrial users to render photorealistic scenes and unlock ray tracing in mixed reality. The Varjo-ready software ecosystem of over 100 third-party PC applications and 3-D engines integrates the XR-4 series into the world's most demanding workflows.

Vrgineers Unveils New Mixed Reality Headset

The US-Czech startup, Vrgineers, Inc. [Booth 3018], specializing in virtual and mixed realities for pilot training, has teamed up with AMD and NVIDIA, graphical chip rivals, to pioneer an innovative architecture for mixed reality simulators. The new mixed reality headset, XTAL 3 CAVU [Ceiling and Visibility Unlimited], is being unveiled this week at I/ITSEC 2023.

According to company representatives, mixed reality technology is gaining momentum in the simulation industry, especially in the pilot training environment, and is expected to surpass the usage of standard projection-based simulators. Today's mixed reality technology has been limited by the quality of image sensors and high-performance requirements.

To address this challenge, Vrgineers designed an innovative system that eliminates calculation bottlenecks and brings mixed reality to the forefront of the industry with its new XTAL 3 CAVU. The mixed reality system utilizes 24Mpix image sensors that are connected to Xilinx FPGA PCIe16x card (chip manufacturer acquired by AMD) via optical cables.

Marek Polcak, Vrgineers chief executive officer, explained, "By utilizing AMD Xilinx FPGA in a combination with NVIDIA Quadro card, we found a way to provide a much needed performance boost for mixed reality, which is far above that of the two fastest graphical cards, with much lower latency as well as power consumption."

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DASD Highlights Training Priorities

This morning's Senior Leader Panel [1030-1200 Hyatt Windermere Ballroom] provides I/ITSEC attendees an opportunity to learn about training priorities and challenges across the armed services as well as the Department of Defense (DoD). The DoD perspective will be presented by Caroline Baxter, Deputy Assistant Secretary of Defense for Force Education and Training.

Speaking to *Show Daily*, Baxter began by reflecting on her participation at last year's I/ITSEC, when she asserted that the US was running out of time to transform training.

Asked if she still feels the same sense of urgency a year later, she replied, "My short answer is yes, absolutely. But I want to be very clear that my sense of urgency is not a product of some crystal ball I have in my office in the Pentagon, but rather it comes from witnessing the speed with which technology is transforming what could be possible, for us and for the rest of the world, for good and for bad. We have a truly extraordinary force that delivers across the battlespace every day. And our ability to do that rests almost entirely on rigorous training and education. But let's also remember what the term 'pacing challenge' connotes, which is fluidity, dynamism, the ability to react basically anything that is the antonym of stagnant and predictable. So as a result, we need to rapidly accelerate our ability to be nimble and creative and integrate."

Baxter added, "Since the conference last year, we have as the DoD, leaned very far forward to make progress on rethinking and refreshing and really transforming military training to accelerate that progress towards adaptability and resilience. As the global environment changes, as the capabilities of our adversaries evolve, our training capabilities must keep pace, and I'm very proud of what we've accomplished. But I am always cognizant of the fact that there is a lot of work left to do."

In terms of specific actions taken by her office over the past year, she pointed to the set-up of a Military Training Executive Steering Group (MTESG) and the establishment of the Defense Training Government Cycle (DTGC) to help the DoD identify, prioritize and invest in transformative training capabilities.

Shifting to DoD training priorities, Baxter identified four key areas: greater realism in training; a focus on relevance; addressing information sharing barriers; and continuing to improve our military training infrastructure.

In the case of greater realism in training, for example, she explained, "Developing ever more realistic training [means] training that accurately replicates, as closely as possible, what the future fight would look like. Now, with that increase in realism comes a concomitant increase in our ability to pivot into the virtual and constructive domains. So we are focusing on enhancing LVC [live / virtual / constructive] capabilities and proliferating that across the force as quickly as possible. Simultaneously, we're also working to ensure global threat multipliers — like climate extremes and climate change — are taken into account as a stressor."

After reviewing the other three priorities,

she noted, "The MTESG and the DTGC are enabling the progress along all of those priorities, and because of that, we have a number of pretty robust and very data informed lines of effort in place that will help the DoD achieve those goals of multi-domain joint training at the tactical and operational levels."

Asked about the importance of interoperability challenges, she responded, "Interoperability [is] the ability to act together coherently, effectively and efficiently, to achieve those tactical operational and strategic training objectives. The way that we are conceiving of the challenges of the future fight, certainly anything relating to the pacing challenge, demands the kind of interoperability that I'm not sure we've seen in past. That requires a true reconceptualization of what training truly means; what is the weaponry that we need to field; what is the requirements generation process for that; and then the rapidity with which we get things from concept into the field and into the hands of the warfighter. All of that has to speed up a whole heck of a lot. Oh, by the way, the technological advances that we're seeing in terms of things like artificial intelligence, and automation, are demanding a new understanding of what interoperability will have to meet a data specific level. All of those technologies accelerate our desire to 'put some wins on the board' for the joint force."

Baxter praised the "tremendous" alignment of and support from leaders across the DoD on these efforts, highlighting how her office has been working to capitalize on that to accelerate progress.

"However, to accomplish everything on our plate, I think we're going to need to do a few things," she said. "The first thing is we need to improve our own ability to capture and catalog our own current training capabilities in order to have a common starting point for any assessment of training quality. And by quality,
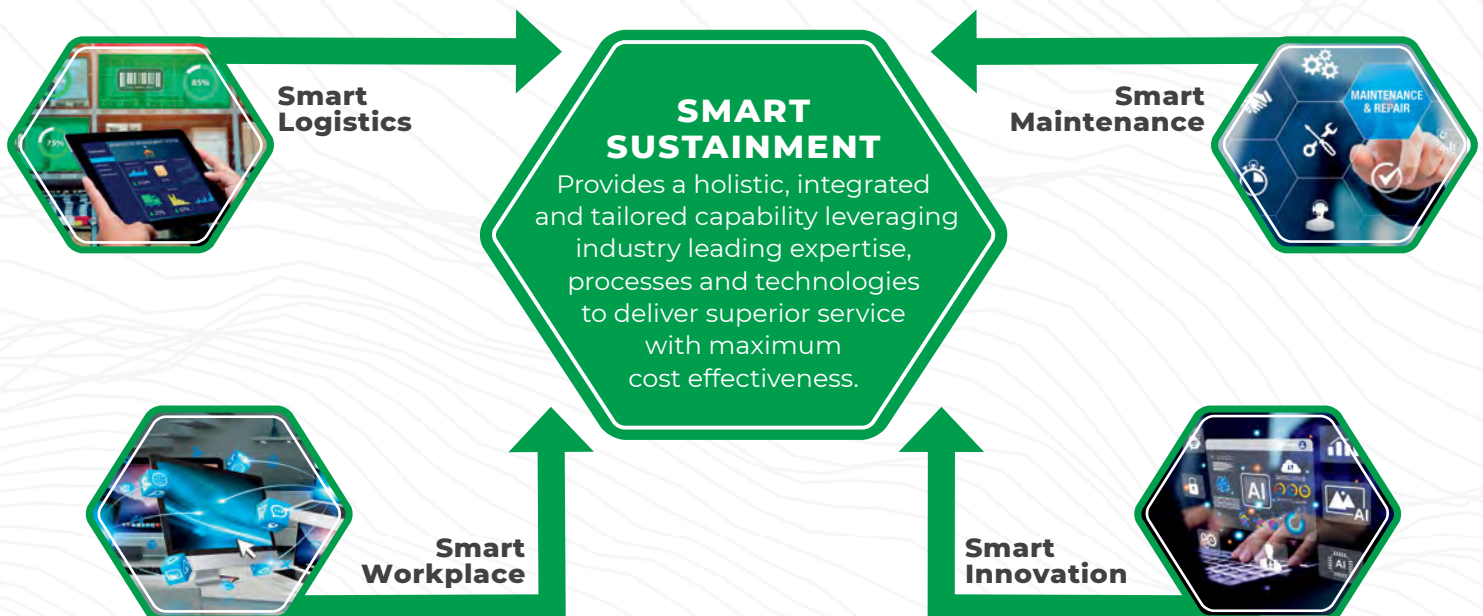
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DASD Highlights *... continued from p24*

what I really mean is the combined metric of realism and relevance. That data would provide us the yardstick by which we could measure the distance between the force today and all the tools it has today to get ready for the future fight, and the force we need to then build over the future. That would significantly enhance our ability to make smart choices on where to apply that last marginal dollar. The second thing is, I think we need to have a comprehensive and cogent understanding of what that high end all domain fight would demand in order to generate realistic requirements."

"

We need to foster interoperability and alignment as early as possible such that we don't buy downstream risks of assuming flexibility and weaponry that does not exist.

She added, "Building off of that, the third thing is directing additional attention towards interoperability."

Baxter concluded her message with her view on what the I/ITSEC community can do to advance the efforts of her office.

"I think the only way that we'll be able to accomplish any of this is by, with and through the services, the combatant commands, our allies and partners and our industry colleagues," she summarized. "And let me take each one of those in turn. From the services and combatant commands, my exhortation is to help and continue to collaborate with my office in sharing information and data, advocating for training and exercises and helping us to transform our capabilities across the DoD. We need to understand what your requirements are, what your gaps are, and how to, as quickly as possible, fill them. Now that might be a service solution that we can then expand to proliferate across the joint force. But open dialogue across the services and [combatant commands] will be vital for that with our allies and partners. The United States doesn't fight alone. We never have. We never will. And as we evolve our training capabilities, we need to understand their requirements as well and where they are seeing their own defense industrial bases evolving. We need to foster interoperability and alignment as early as possible such that we don't buy downstream risks of assuming flexibility and weaponry that does not exist. We also need to learn from their experiences of fighting as they train and training as they fight. And I think it will be very critical to come up with some kind of common TTPs [tactics, techniques and procedures]. And to industry: help us to keep pace with that shifting security landscape, the shifting pace of technology, experimentation, helping us understand how to do that better, experimenting with and rapidly fielding new tools and technologies."

"Here's the point: success in the future depends on unburdening ourselves of a few assumptions. The first is that technology alone will guarantee success in future conflict. The second faulty assumption is that the issues with the platforms we have today are that they aren't exquisite enough. The problem with both of these assumptions is that they enable a dangerous over-emphasis on platforms over people. So what does this mean? It means that industry must come up with technical solutions that prioritize speed and flexibility – especially flexibility during conflict. Solutions that are so exquisite that they slow the fielding of future capabilities aren't solutions. On the contrary, rapid fielding of platforms that have the flexibility to adapt to lessons learned in active conflict enables the fluidity that will be the hallmark of the future force. Industry must respond to services and combatant commanders when they voice the need for platforms that adapt to their forces' battlefield requirements. It also means services must be deliberate in their articulation of their requirements and seek joint solutions as a matter of course. Combatant commanders in turn must articulate the operational need for elegant solutions that lead to flexibility, and the defense industrial base needs to listen the first time to the DoD's stated need for sustainable, flexible, and attritable solutions. I/ITSEC provides the perfect venue for a discussion between the DoD and industry; let the conversation begin."
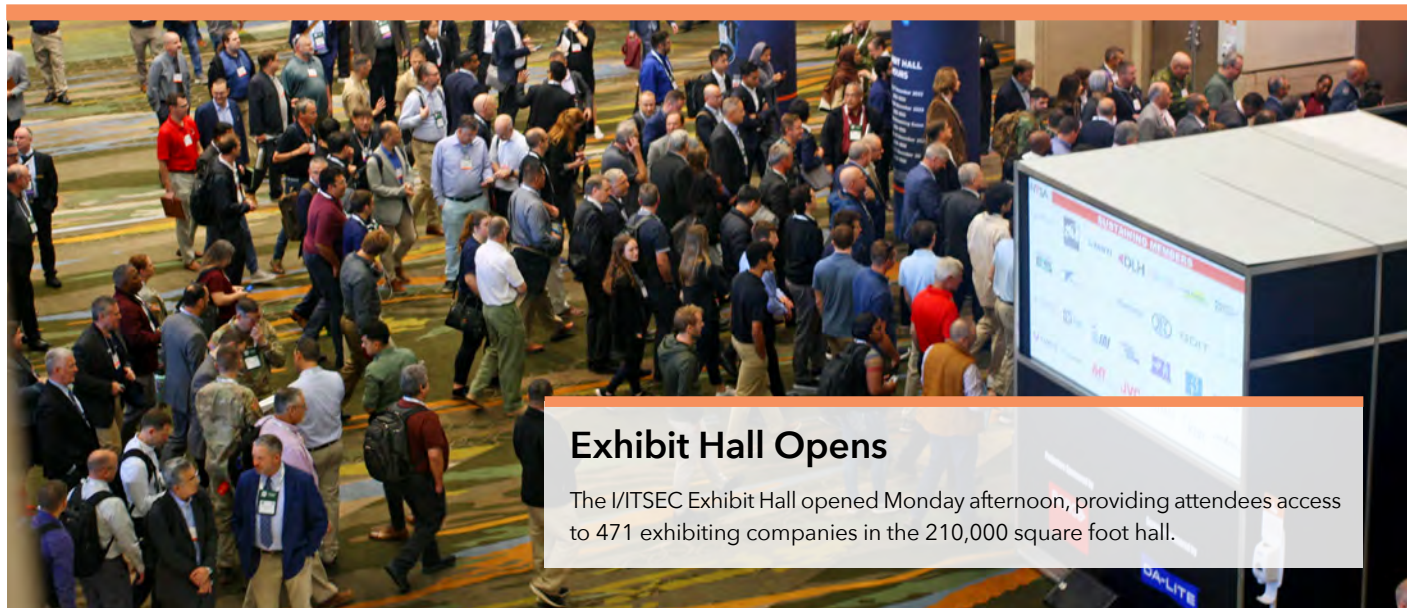

Exhibit Hall Opens

The I/ITSEC Exhibit Hall opened Monday afternoon, providing attendees access to 471 exhibiting companies in the 210,000 square foot hall.

Air Force Expanded Training ... *continued from p1*

extremely well qualified in the area of radios. That's just one example. We're really working on that and making good progress."

Another activity area is potentially moving to a cloud instantiation of SCARS that could reduce the need for on-site compute capability and provide parallel benefits with cybersecurity.

Along with SCARS, Ryan cited "significant activity" with the Joint Simulation Environment (JSE) "since last year's I/ITSEC," beginning with the December 2022 assignment of a Program Executive Officer for the acquisition, fielding and sustainment of JSE.

"Another key thing that happened a few months later, in March 2023, was the assignment of Air Combat Command as the lead MAJCOM [Major Command] in the support of scaling and continuing development of JSE as a capability," he added. "So those are two really important foundational and structural things when it comes to acquiring a capability for the Air Force. And they are now in place."

He identified one more significant event that occurred in September 2023, when "the F-35 program, using the JSE at Pax River [Naval Air Station Patuxent River], was able to accomplish all of their 'runs for score' for IOT&E [Initial Operational Test and Evaluation] for the F-35 program. That was a really important accomplishment that they were able to get through all the runs for score. Of course, there is a lot of data reduction and analysis that happens after that, but those have all been executed now. So that was a really important milestone.

"Essentially, that leads you to being able to put a stake in the ground and say, 'We now have a validated baseline for JSE that was used in support of the IOT&E mission for F-35. So there is an accepted, validated, and even accredited now, use case for JSE for the purposes of getting that IOT&E done. And that same baseline of capability then has been used for a lot of training activity as well for F-35."

Looking to FY'24, Ryan said that the Air Force plans to expand implementation of JSE from the current single site at Pax River to Nellis Air Force Base in Nevada.

> **We're standing up a pretty robust modeling team here in the simulators division. And we can use modeling across the spectrum of stages, from requirements to functional architectures to physical architectures and then to installed systems.**

"That will be the first location for the Air Force to also have a JSE implementation," he offered. "So we will stand up there with F-35s. Also in FY'24, you will see the integration of an F-22 'fighter in a box' with the JSE ecosystem or environment. That will be a capability that comes online in this fiscal year as well. So we will have not just one platform that is integrated for a virtual operator in the loop, real-time experience, we will have both F-35 and F-22 integrated by the end of this fiscal year."

He summarized, "The whole point of JSE is to provide that high-density, high-fidelity environment that has an advanced representation of the electromagnetic spectrum. That's kind of the thing that sets JSE apart: being able to implement those electromagnetic spectrum operations in real time, with operators in the loop, with a level of fidelity that we have not been doing previously. The other piece that you get from JSE is the experimentation capability and being able to really use this across the whole lifecycle as you develop a capability, test it and then field it and put operators in a seat. JSE is there for that entire process to support testing, training and experimentation on the front end or even throughout a program where you can add capability concepts to a weapon system and see if it has merit to making a kill chain better."

Ryan pointed to other ongoing initiatives involving leveraging model-based systems engineering (MBSE) that underpins both SCARS and JSE.

"We're standing up a pretty robust modeling team here in the simulators division," he stated. "And we can use modeling across the spectrum of stages, from requirements to functional architectures to physical architectures and then to installed systems. And really, there are significant efficiencies that we can gain from those in understanding how you move from requirements to verification,

Air Force Expanded Training ... *continued from p28*

and being able to be more efficient with our verification, both in SCARS and in JSE, and then even setting up automated verification scripts that build directly out of MBSE. The team is working on those kinds of capabilities because we want to get to the point where, when we make an update in JSE, we're able to verify that baseline rapidly and get that out to the fleet, and not be working on that last step of integration and verification for an excessive amount of time. Because part of the power of JSE is being able to provide it in a timely manner, out to the test forces and out to the combat forces. So we want to make sure we're able to stay in sync with them from a timeliness standpoint. And I really see a lot of opportunity using MBSE capabilities and tools to achieve that desire to be timely with our delivery on JSE, and same with SCARS."

Another ongoing effort highlighted by Ryan was the implementation of a Common Visual Database.

"That has been an activity that is highly relatable to SCARS and the idea of sharing common components and applications," he said. "It's that same thread and idea of encouraging interoperability and also being more affordable with investments, because I can make one investment and use it many times

"

My specific message at I/ITSEC is that JSE is going to be a transformational capability for the Air Force and the Navy, both for training and for weapon system development and sustainment."

over across a portfolio of devices. We kicked off that effort just prior to the end of FY'23 and we are looking forward to that moving ahead in FY'24. There is still a lot of work to do there, but it's another exciting opportunity in front of the team."

In his closing message, Ryan emphasized, "First, certainly, our focus has been and will continue to be that we are here to 'sharpen the bite' of the warfighter. We want them to be equipped to fully utilize every single tool put into their hands with regard to the weapon systems they're given. Additionally, my specific message at I/ITSEC is that JSE is going to be a transformational capability for the Air Force and the Navy, both for training and for weapon system development and sustainment. It is going to change the way we do business, fundamentally. I wholeheartedly believe that. In fact, it may quite possibly be the most significant thing that comes out of the F-35 Program. So my message to I/ITSEC attendees is that we are still developing the strategy for exactly how we're going to proliferate JSE, and I am confident we're going to need the help of a lot of folks that are going to be at I/ITSEC. So I urge them to be on the lookout for more information about how to become a part of the greater team that's going to continue to develop JSE and to field that capability for the Air Force and for the Navy."

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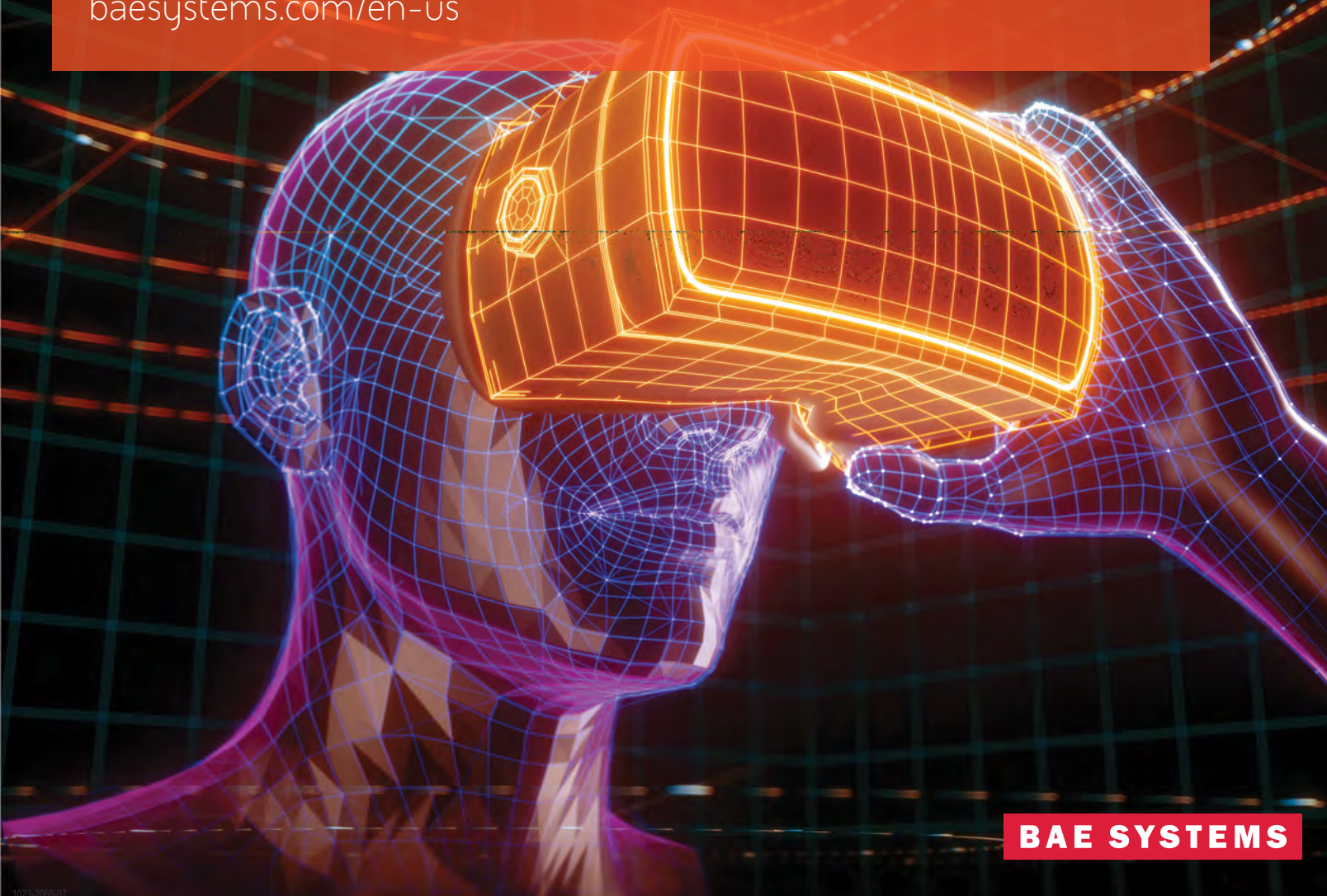
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18th Annual Serious Games Showcase & Challenge [Booth 3181]

The Serious Games Showcase & Challenge (SGS&C) is one of the main attractions at every I/ITSEC, and plays a critical role in helping to generate interest in the use of digital games and virtual reality applications for training and education. The SGS&C provides a showcase of best-in-class learning games submitted by business, government and stud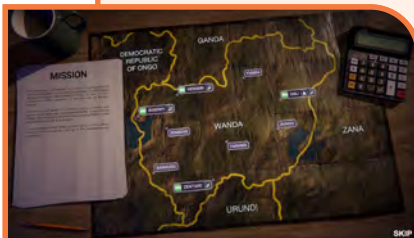ent developers, and awards noteworthy games to recognize their achievements. The true uniqueness of the SGS&C is that every I/ITSEC "player" has the chance to play the games, talk with the developers and cast a vote for the coveted SGS&C People's Choice Award. The SGS&C team is appreciative of this year's sponsors: ARA Virtual Heroes Division, Engineering & Computer Simulations, Ternion Corporation, VMASC, NTSA, Hatalom Corporation, HP, Box.com, RINA Consulting Defence Ltd. and BreakAway Games. Be sure to visit SGS&C [Booth 3181] to check out the games and cast your vote for the People's Choice Award before voting closes on Wednesday at 1800. Award winners will be announced on Thursday, November 30 at 1300 at the Innovation Showcase [Booth 2588].

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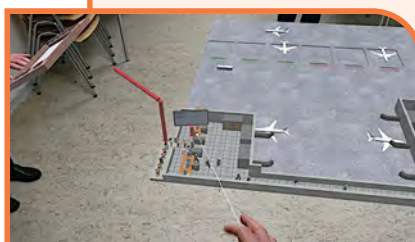
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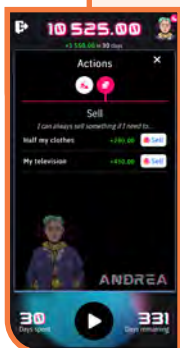
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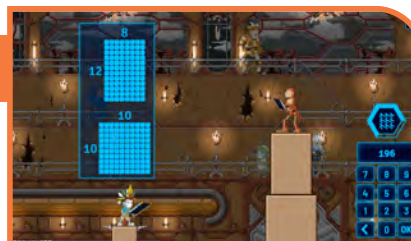
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Ternion Adds UAV Video to Air Force Trainer

Ternion Corporation [Booth 2220] is highlighting its use of the new FLAMES Unreal Engine option to add unmanned aerial vehicle (UAV) video generation to the Command-and-Control Weapon System Part Task Trainer (C2WSPTT) that is embedded in the US Air Force Air Operations Center-Weapon System (AOC-WS). The C2WSPTT is designed to simulate air operations realistically and directly exchange tactical data with other AOC-WS systems to allow operators to perform as they would in wartime and "train as they fight."

According to Brad Spearing, president of Ternion Corporation, Airmen working in the AOC-WS during real-world operations frequently use UAV video feeds, so adding a UAV video feed capability to the C2WSPTT further enhances the training benefits of that embedded system. Moreover, he emphasized how the C2WSPTT is unique because it only takes a small amount of hardware and a small number of people to operate it.

"AOCs don't have room for another box in there just to support a training activity," he said. "The way they display it is in a web browser, and they've got web browsers on every computer there in the AOC-WS. So we needed a solution that would not require any additional hardware and be displayed in a web browser just like it is when they're in war."

"We're not the only ones who can produce PTT UAV video," he acknowledged. "But we are the only ones who can produce it with such a small footprint and display it on a web browser, just like operational systems."

Spearing emphasized the use of FLAMES in providing the new C2WSPTT UAV video capability, explaining, "Over the last few years, we've developed a large number of simulations for a lot of people, and we always use our commercial off-the-shelf simulation framework that we call FLAMES. In fact, FLAMES was what we used originally to develop the [C2WS] 'PTT' in the first place. That's been there from the very beginning. It provides a framework that allows our customers or us to build custom simulations."

Acknowledging that FLAMES has "been around for many years," he outlined a continuing evolution of new features. One recent enhancement was last year's decision making the FLAMES development environment free, reflective of a lesson Spearing credits to the company's good relationship with Epic Games and that company's approach of giving away the development environment for Unreal Engine.

"The most recent enhancement was just released in August of this year, involving our integration of Unreal Engine directly into FLAMES," he continued. "So we're the only constructive simulation in existence with that direct integration."

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SoarTech Highlights Adaptive Training and Emerging Medical Capabilities

SoarTech [Soar Technology, LLC, Booth 339] is highlighting three key advances at I/ITSEC 2023, according to Brian Stensrud, PhD, director of simulation at SoarTech. "One is generative artificial intelligence (AI), a second is adaptive training and a third is in our emerging medical focus area," he said.

As an example of the adaptive training focus, SoarTech has been awarded a Phase III Small Business Innovation Research contract to develop and deliver a virtual, adaptive training system for the US Navy Basic Electricity and Electronics School.

"This is an existing course that the Navy provides to its young Sailors," said Stensrud, and a prerequisite to electronics-focused Navy jobs.

"In our Phase III we are developing, with our partners at i3 [Integration Innovation, Inc., Booth 2560], a virtual training simulation that includes an adaptive training capability for the students," he explained. "They have a virtual environment that allows them to learn and practice basic electronics principles across Navy curriculum. They're provided opportunities to test their skills and knowledge, and the system will automatically provide computations of their competence and their needs that an instructor can use to appropriately adjust the training and understand the competencies of their students."

If a student struggles with a particular concept, Stensrud said, "the underlying system performs that analysis, and then both adapts the training to suit the student as well as provides information to the instructor so that the instructor can know that they may need to spend some extra time with a student."

"The key reason that this is important, the key problem that we're solving here," Stensrud continued, "is that the Navy struggles, in particular, with this course. It's a very dense set of material, and not an easy topic." Because it is a prerequisite to others, "there's a big bottleneck if they're not able to complete this course. So, there is a high desire to

be able to speed up their training pipeline."

This training system allows instructors to provide extra help to some students, but also accelerate students who already know the material. "We're hoping to speed up both ends, helping the students that need more individualized training, as well as speeding

up those who have the knowledge and can move through quickly," Stensrud said. "It's a time-consuming and costly process, so if we can speed it up, we're saving the Navy time and saving them significant dollars."

Referring to the virtual and adaptive aspects of this effort, Stensrud emphasized the flexibility of the solution. "We see that this combination of technologies is incredibly powerful and, we think, has applicability across the services for a multitude of different courses and potentially different modalities."

SoarTech is also spotlighting two of its AI-based medical decision support capabilities at its booth – Intelligent System Architecture for Autonomous Care (ISAAC) diagnosis and intervention system and Special Forces Autonomous Vital Injury Observation and Rescue (SAVIOR).

Joseph Cohn, PhD, director of the Medical and Readiness Team at SoarTech, explained the significance of its medical capabilities in prolonged field care. "The military is shifting to a distributed operations approach to combat, which ultimately means they'll have fewer folks dispersed over greater areas," he said. "From a combat perspective, you'll see a lot of technologies that help to tie those people together, ignoring the tyranny of space and

time. From the medical perspective, we're working on solutions that will help overcome the fact that our warfighters will be far enough away from definitive care that they'll either have to find ways to treat themselves until we can bring them back, or the small cadre of uniformed healthcare professionals that go with them will have to have a phenomenally new and advanced toolkit to stabilize, sustain and maintain injured warfighters for a longer period of time."

SoarTech lead scientist Alyssa Tanaka, PhD, said that reflecting those needs, ISAAC and SAVIOR are "clinical decision support tools that have been developed for the government."

"ISAAC is built off of our Episodic Explanation Engine, EpEx," she said. "That's a causal reasoning capability, and that's the fundamental, underlying capability of ISAAC."

The goal of ISAAC is "to provide clinical decision support to a medic in a prolonged field care situation," she said. In that setting, she explained, as monitored vital signs and medic-entered contextual information about a patient's condition are input into the app, ISAAC produces an initial diagnosis while also generating questions to refine that diagnosis. "It's providing an entire explanation generated in real time from all of this information that's coming in."

Cohn added, "You'll see in the booth that everything we focus on AI-wise is about building trustworthy and trustable AI. The way we do that is to create a situation where the AI is working with the user. In this case, it's using our explanation engine to help walk the provider through the decision path that explains how they got to the diagnosis. It makes them part of the conversation."

Tanaka explained that the other highlighted capability, SAVIOR, is intended for use by injured warfighters who are isolated from recovery for extended periods. Monitoring patient vitals and resource availability and consumption, it provides diagnostic and treatment recommendations and communicates autonomously with support teams downrange.

"The bottom line," said Cohn, "is that we're applying AI to redefine how we care for the global force."

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OEI Spotlights Female Manikin Simulator

Operative Experience, Inc. (OEI) [Booth 2480] is utilizing the I/ITSEC venue to spotlight its latest female model Prolonged Casualty Care Simulator Pro (PCCS Pro) manikin that was developed from a Small Business Innovative Research contract awarded by the Army's Program Executive Office for Simulation, Training and Instrumentation (PEO STRI).

According to Paul Bernal, vice president of global sales at Operative Experience, Inc., the new PCCS Pro effort reflects the findings of a study released by the National Institutes of Health that reflected lower survivability rates for women with tactical injury patterns similar to men during both Operation Iraqi Freedom and Operation Enduring Freedom.

"They were trying to figure out why this happened," he explained. "And they thought it might reflect the anatomical differences between male and female and the fact that medics on the front line treat a female patient extremely differently from a male patient."

Bernal said that, during development of a new female manikin, company designers observed that some medics training on women did not expose possible injuries the same as they did on males.

"Rather than actually exposing the patient [for injury assessment], they came short of exposing the female patient at the underclothing stage of the bra or the underwear. They had to 'train the students off something' that they had been told for many years. It was ingrained in them so much that they stopped short of fully exposing the female patient and were missing vital wounds that could cause mortalities," he said.

As with the company's Tactical Combat Casualty Care Pro (TCCS Pro) manikin, the female version of the new PCCS Pro was modeled on data compiled about service women by the US Army Research, Development and Engineering Command.

Bernal said that the new PCCS Pro female manikin is the only design that allows training from the point of injury through all echelons of care.

"Up until now you had to have a certain manikin for point of injury training that was robust enough to withstand that environment," Bernal explained. "And then you had to switch to a more advanced clinical manikin for advanced care training. But now you don't have to switch manikins. And that is a huge breakthrough for the market, having one manikin for all levels of care versus having to have multiple manikins for the different roles of care."

In addition to its robust characteristics, Bernal highlighted the broad range of injuries that can be presented and treated.

"If you began at the very basic level, PCCS Pro covers all the things, at the point of injury, that a non-medic combat lifesaver is going to need to give that patient a better chance for survival," he said. "For example, they can stop the bleed with tourniquets at the point of injury, which has been the biggest killer, and then as you progress into the different roles, you give medical personnel an opportunity to actually perform interventions on a patient even further, like intubation, or a cricothyrotomy or relieving a pneumothorax via a needle or perhaps even chest tubes. Those are the kinds of things that our manikin brings to the table. Another feature that our manikin brings is modularity. Something that the Army really wanted to have is the ability for that medic to change different wound patterns. Up until our manikin, manikins came in one configuration. So what happened was that, as you trained as Soldiers, or medics trained

every year, they knew exactly that manikin had a right amputation. Or that a particular manikin had a gunshot through the left chest. So it really wasn't a challenge anymore. But what our manikin does is give the ability to change the wound patterns up to 64 different configurations. So you can have a manikin that is completely without any trauma, such as a clinical patient before deployment, or you could have a manikin that has extensive trauma, where an IED explosion could cause multiple burns and injuries. So you can have that combination from one extreme to the other, something that no manikin offers today."

❝

You can go into prolonged field care… We can monitor the patient like they would in the field.

He continued, "In addition to that, with our manikins, you can go into prolonged field care, where you can actually have them be monitored using the same monitor or emulator monitor that they would use in the deployments. We can monitor the patient like they would in the field. You can also monitor the output through catheterization of the manikin."

Bernal added that PCCS Pro realism is further enhanced by the size and shape of the new female manikin.

"From a physical sense, this is a truly realistic female manikin, something that has not been in the field in trauma care. Before this manikin, some in the military tried to simulate a female by using a male manikin and providing it with female genitalia and a mask. They called it a female patient that happened to be a 6' tall manikin weighing 185 pounds. For our design, we got our data on the average mean of a female Soldier in the United States Army. So we made our manikin 5'4" tall and weighing 135 pounds," he said.

Bernal pointed to one final round of operational testing on the new manikin, now slated for the first quarter of calendar year 2024, concluding, "What the military has done with this SBIR is to build a manikin and give it capabilities that are going to be needed to train the force for present and future battlefields."

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