AFRL
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Photos by 711 HPW/RHA

LIVE-VIRTUAL-CONSTRUCTIVE DEMONSTRATION PROVES TO BE A GAME CHANGER

On 14 November, at the National Center for Medical Readiness, the Warfighter Readiness Research Division demonstrated the potential of its live-virtual-constructive (LVC) training capabilities to a visiting team from exercise Red Flag-Rescue. The Division's intent for the demonstration was to show how Red Flag-Rescue could integrate LVC capabilities in new and different ways.

The integration of LVC enables the best attributes of each component to be combined effectively into one training environment. During a training scenario, participates operate their systems in real time (live) parallel to the identically replicated (virtual) scenario with simulated warfighting equipment and conditions. The constructive component uses computer-generated people in a game-like simulated scenario to provide the participants as realistic an experience as possible in a training environment.

During the demonstration, the Division showed the team how the LVC proof-of-concept can help solve problems, reduce costs and ease scheduling difficulties for training participants. It is often a challenge for Combat Air Force aircrew to get together to train, because of deployment schedules, other required training or availability issues. The LVC capabilities offers aircrew the potential to fly and interact with each other in a constructive or synthetic simulated environment.

Red Flag contract site lead, Cedric Stark, who observed the demonstration, was impressed with the LVC capabilities and sees their training potential for Red Flag-Rescue.

"I enjoyed the demonstration as it showed the live, virtual and constructive future of Red Flag-Rescue. Seeing the future opportunities in the virtual realm, such as fighter simulators operating from their stations, but will plan, brief, execute and debrief as if we were together is staggering," said Stark. "This is a game changer, a force multiplier for us, as it increases our ability to integrate distributed joint airpower and enhance our ability to train contested Combat Search and Rescue missions."

The success of the demonstration reinforces the positive outcomes that result from the collaborative efforts between the Division and Detachment 1, 414th Combat Training Squadron, who host Red Flag-Rescue. Together, the organizations have collaborated on participants' performance measurement and methods to increase the knowledge, skill and proficiency of the personnel recovery community for the past three years. ☆

Suzette Westhoff, Senior Technical Writer/Editor
Ted Harmer, Medical Readiness and Personnel Recovery Training Research Lead

711th Human Performance Wing, Airman Systems Directorate, Warfighter Readiness Research Division

I/ITSEC 2019

At this year's Interservice/Industry Training, Simulation and Education Conference (I/ITSEC), the Air Force Research Laboratory's Warfighter Readiness Research Division showcased how its innovative technologies are optimizing warfighter proficiency. In their United States Air Force Training Systems Product Group booth, Division subject matter experts exhibited several innovative technologies, including the Mission Planning and Debrief system and the Virtual, Augmented and Mixed Reality for Aircraft Maintenance. Division staff also presented peer-reviewed papers and participated in professional workshops, the Iron Dev team competition and the I/ITSEC Walk, Run or Roll 5K. The conference, which is the largest modeling, simulation and training event in the world, provided Division, industry, academia and government participants the opportunity to keep abreast of training, simulation and education solutions and to network with like-minded professionals. ☆

Ms. Suzette Westhoff, Senior Technical Writer/Editor

MISSION PLANNING TECHNOLOGY DEMONSTRATION LEADS TO NEW OPPORTUNITIES

At I/ITSEC 2019, the Mission Planning & Debrief team successfully demonstrated their prototype mission planning technology for the complex, contested peer conflict of the future. The demonstration showcased a human-machine teaming environment with computational intelligence (software agents) supporting the human planners in various aspects of the planning process. These agents were involved in parsing an air tasking order, producing an initial hack of the mission plan, building constraints from other planning documents for the airspace and end-product generation. The demonstration generated interest, leading to more than a dozen new collaboration opportunities with other military branches and industry. Additionally, the team gathered critical feedback and suggestions from many subject matter experts that will help guide future development and improve functionality. ☆

Mr. Brandon Nolan, Associate Computer Scientist

Photo by North America Corporation

After completing the I/ITSEC Walk, Run or Roll 5K, Division personnel pose for a photo. The charities benefited by this year's event include the I/ITSEC STEM (science, technology, engineering, mathematics) Initiative and the Camaraderie Foundation. Pictured from left to right are Lt Col James Bowers, 2d Lt Noah Scott, Mr. Sean Kennedy, Dr. Luke Nelson, Dr. Glenn Gunzelmann, 2d Lt Lauren Gallego, Dr. Kevin Gluck and Ms. Meghan Sorensen.

VIRTUAL MAINTENANCE TRAINING NEXT DEMONSTRATION WITH AEROSPACE SYSTEMS DIRECTORATE

This year, the Warfighter Readiness Research Division's GRILL® (Gaming Research for Integration Learning Laboratory®) team supported the Aerospace Systems Directorate's, VAMRAM (Virtual/Augmented/Mixed Reality for Aircraft Maintenance) team in promoting both augmented- and virtual-reality applications that could help enhance Air Force maintenance training. The GRILL team constructed a virtual-reality trainer that enables maintainers to change an F-16 aircraft tire in a virtual hangar. The tire-change training application includes a virtual-environment video component where the maintainer can view a live aircraft tire change, with play, pause, rewind and fast-forward buttons and 44 virtual-tool sets with tool descriptions. The VAMRAM team showcased an augmented-reality application that allows users to view a step-by-step process of changing a bicycle tire. Users can interact with the bicycle parts to assemble and reassemble these pieces with the guided support of an augmented-reality application.

The GRILL and VAMRAM teams' collaboration helped both teams develop a better understanding of the potential of proficiency-based training for the Maintenance Next effort. Specifically, this collaboration helped meet the dynamic needs of today's warfighters by

- Identifying training gaps and associated application requirements
- Determining how to assess the utility and effectiveness of mixed-reality solutions
- Enabling the creation of a development and testing plan that addresses maintainers' learning objectives and performance support capabilities
- Obtaining the resources and expertise required to actually build and evaluate mixed-reality technology☆

Lt Dave Clement, GRILL Program Manager

IRON DEV CHALLENGE

The GRILL® (Gaming Research for Integration Learning Laboratory®) team participated in the inaugural Iron Dev event at I/ITSEC. The team included Mr. Jonathan Diemunsch, Mr. Quintin Oliver, Mr. Jerry Huggins, Mr. Jack Hu and Mr. Will Graver. The event's structure was based on competitive cooking shows where teams are given a challenge and "secret ingredient." The Iron Dev Challenge was to develop a training solution to improve warfighter readiness. Some of the event's sponsors provided equipment and the competition awarded bonus points for using that equipment.

On the first of the two-day competition, the teams received the challenge, which was "Winning the War of Cognition" with the secret ingredient of "Iron Man." The intentionally vague prompt provided opportunities for each team to interoperate differently. However, this open-endedness resulted in additional challenges. One challenge was the team struggled with the lack of direction. Another challenge was that the teams' individual solutions were impossible to compare.

The team selected a SERE (survival, evasion, resistance, escape) task as the challenge to solve. This task involved using a topographical map to identify a training participant's position and the location of an adversary. After identifying the correct coordinates, the participant could call in an air strike on the adversary.

At the conclusion of the competition, the teams presented their solutions to the judges and discussed their solutions with interested audience members. The GRILL team won the "Most Innovative Solution," which was sponsored by ML Horizons. Along with the recognition, the team received a Magic Leap headset.☆

Mr. Jonathan Diemunsch, Software Engineer

Congressman Bobby Scott (Virginia), Congresswoman Stephanie Murray (Florida) and Congressman Jack Bergman (Michigan) visiting the Air Force booth. The demonstrations included VAMRAM technology from the GRILL and a demonstration from the Mission Planning & Debrief team.

Photos by Ms. Shania Horner

RECOGNITIONS

711TH HUMAN PERFORMANCE WING

RHA 3RD QUARTER WINNERS

Company Grade Officer:
2d Lt Dave Clement

Field Grade Officer:
Maj Jason Lingle

Civilian CAT-II of the Quarter:
Mr. Nicholas Oyler

Civilian Category III:
Mr. Garrett Goodin

Collaboration Award:
Dr. Leslie Blaha

Lab Scientist:
Dr. Chris Myers

Chuck Norris Award:
Ms. Kaylee Eakins

RHA ANNUAL AWARD WINNERS

Non-commissioned Officer of the Year:
SSgt Kacper Sovinski

Company Grade Officer of the Year:
Lt Julian Barriga

Field Grade Officer of the Year:
Maj Eric Wolf

Supervisory Award:
Maj Miguel Valle

Civilian Category II of the Year:
Ms. Cayley Dymond

Civilian Category III of the Year:
Dr. Glenn Gunzelmann

James W. Brinkley Leadership Award:
Mr. Lon Hopson

International Award:
Dr. Winston Bennett

Daniel Repperger Mentor of the Year Award (Individual):
Dr. Christopher Myers

Thomas S. Wells Senior Leadership Award (Individual):
Mr. Phil Peppler

Harry G. Armstrong Scientific Excellence Award:
Dr. Kevin Gluck

Scientific/Technical Management (Individual):
Mr. Garrett Goodin

NEWS FLASH

PUBLISHED CONTENT

Top 10 Scientific Publications of 2018

Bella Z. Veksler, Glenn Gunzelmann

"Functional Equivalence of Sleep Loss and Time on Task Effects in Sustained Attention"

Matthew Walsh, Kevin Gluck, Glenn Gunzelmann, Tiffany Jastrzembski, Michael Krusmark, Jay Myung, Mark Pitt, Ran Zhou

"Mechanisms Underlying the Spacing Effect in Learning: A Comparison of Three Computational Models"

Recent Publications

Bedi, S. (2019, December). Air Force studies fatigue, sleep to enhance readiness. *Air Force Surgeon General Public Affairs.* Retrieved from https://www.af.mil/News/Article-Display/Article/2047256/air-force-studies-fatigue-sleep-to-enhance-readiness/

Blaha, L. M. (2019). We Have Not Looked at Our Results until We Have Displayed Them Effectively: A comment on "Robust Modeling in Cognitive Science". *Computational Brain & Behavior,* 2, 247–250. https://doi.org/10.1007/s42113-019-00059-6

Blaha, L. M. (2019, July). Cognitive models as a computational correlate of theory of mind for human-machine teaming. *Proceedings of the 17th Annual International Conference on Cognitive Modeling.* Montreal, Quebec.

Broomell, S. B., Sloman, S. J., Blaha, L. M., & Chelen, J. (2019). Interpreting model comparisons requires understanding model-stimulus relationships. *Computational Brain & Behavior*, 2, 233–238. https://doi.org/10.1007/s42113-019-00052-z

Fallon, C., Blaha, L. M., Cook, K. & Billow, T. (2019, July) Common ground and autonomy: Two critical dimensions of a machine teammate. *10th International Conference on Applied Human Factors and Ergonomics.* Washington, D.C.

Fallon, C. K., Blaha, L. M., Jefferson, B., & Franklin, L. (2019, Oct.). A capacity coefficient method for characterizing the impacts of automation transparency on workload efficiency. *Proceedings of the 2019 Human Factors and Ergonomics Society.*

Paul, C. L., Blaha, L. M., Bos, N., Fallon, C. K., Gonzalez, C., Gutzwiller, R. S. (2019, Oct.). Opportunities and challenges for human-machine teaming in cybersecurity operations. *Proceedings of the 2019 Human Factors and Ergonomics Society.*

711TH HPW/RHA

Hails

Ms. Annette Armstrong
Dr. Lorraine Borghetti
Lt Col James Bowers
Mr. Greg Beister
Mr. Chris Fisher
Lt Lauren Gallego
Mr. Dustin Hofer
Dr. William Kosnik
Mr. David Massey
Mr. Benjamin McCall
Lt Jessica McCool
Ms. Erin McCormick
Mr. Stephen McGee
Dr. Jack Rhodes
Ms. Katherine Silas
Ms. Gretchen Tarkany
Mr. Jacob Utley

Farewells

Lt Julian Barriga
Mr. Joseph Bedford
Capt Stephen Bell
Mr. David Chastain
Mr. Seth Keadle
Mr. Michael Keehan
Ms. Nancy Strayer
Mr. Charlie Todd

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Published quarterly since 2001, Fight's ON! continues to serve as the Division publication for our partners and features innovative science and technology that is accelerating and revolutionizing readiness.

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- **Operations Support (RHAO)**
- **Continuous Learning and Performance Assessment (RHAS)**