



Senior Leader Perspective: *Dr. Ben Petro, Acting HS COI OSD Lead.* The Human Systems Community of Interest continues to make strong contributions to address key challenges facing our warfighters across the Department. As DoD pivots to address the realities of our changing world while sustaining its technological edge to ensure overmatch against near peer competitors, the HS COI's research ensures sustained focus on the central role the warfighter plays across all platforms.

The HS COI's flexibility, adaptability, and relevance is evident in how well our community is engaging along the three priority lines of effort laid out by Secretary of Defense Mattis in the National Defense Strategy: 1) Restore military readiness for a more lethal force, 2) Strengthen alliances and attract new partners and 3) Bring business reforms to DoD. Later in the Newsletter, I mention several key COI efforts and activities that support these priorities — from among many outstanding efforts you're leading.

Amid the uncertainty of how technology may shape the future battlespace, we can rest assured that the human will remain central to warfare. As such, science and technology that maintains a warfighter-centric focus will always be critical to our Nation's Defense. I am confident that the HS COI and the research and activities of its members will continue to ensure those who protect our freedoms never find themselves in a fair fight.

Thank you all for your creativity, perseverance, and commitment to our warfighters' success!

Hails & Farewells

Hail - Welcome to Dr. Michelle Zbylut from the Army Research Institute, replacing Dr. Sams on the HS COI Steering Group (SG). Her bio will become available later; however, some major areas of interest for Dr. Zbylut are in assessment, testing, and leadership development.

Hail - Dr. Kristen Schaefer Lay is the new National Defense Industrial Association (NDIA) Human Systems Division (HSD) liaison. She's an engineer at ARL's Aberdeen Proving Ground and replaced LCDR Jacob Norris who served in this role for the HSD in 2018. LCDR Jacob Norris did a great job at this year's NDIA Human Systems Conference.

Farewell - Dr. Michelle Sams is now the Director, Human Systems Integration HQ Dept of the Army, G-1 (DAPE-HSI) at the Pentagon, Washington, DC. Our thanks to Dr. Sams for her many contributions to the HS COI, and best wishes in her new job. We hope you'll stay connected to the COI in the future!

Note - The Army named Dr. Corde Lane as the new Director of the Human Research and Engineering Directorate (HRED), effective 30 September 2018. Dr. Lane is now a member of the Army Senior Executive Service Corps. Congratulations!



HUMAN SYSTEMS COI

https://defenseinnovationmarketplace.dtic.mil/communities-ofinterest/human-systems/

<u>Vision</u>: Develop & deliver new human-centered technologies to select, train, design, quantify, protect, and operate for measurably improved mission effectiveness.

<u>Mission</u>: Enhance mission effectiveness through: 1) Integrated simulations for mission training and experimentation, 2) Human-machine designs for mission effectiveness,

3) Assessment of operator effectiveness, 4) Operating through battlespace stresses and5) Mastering the PMESII battle space.

<u>Key Products:</u> Integrated service roadmaps; COI taxonomy, budget & programs; seedling and tri-service ARAP proposals, collaboration opportunities; success stories. <u>HS COI Contact Rosters:</u> Provided at the end of the newsletter

Key Personnel OSD Chair: Dr. Ben Petro (acting) OSD COI Chair: Dr. Kevin Geiss AFRI Navy Lead: Dr. John Tangney ONR ARI Army Lead: Dr. Michelle Zbylut Army Lead: Dr. Corde Lane ARL Army Lead: Mr. Doug Tamilio NSRDEC WG Chair: Dr. Todd Nelson AFRL PAE&T Lead: Dr. Glenn Gunzelmann AFRL SICP Lead: Dr. Todd Nelson AFRL PSWP Lead: Dr. Peter Squire ONR

Feedback: If you have content or suggestions please send to our Newsletter Editor: Alan.Livada.ctr@us.af.mil

DISTRIBUTION A. Approved for public release - distribution unlimited. Case Number: 88ABW-2018-5174, 16 Oct 2018. OPR: 711 HPW/RH





COI HIGHLIGHTS - Past Events

Seedling Winner: OSD selected the seedling proposal titled "Optical Multi-Channel Beamforming for EW" from the Electronic Warfare COI for funding. Our candidate was from the System Interfaces and Cognitive Processing (SICP) subarea, titled "A Cognitive Computing Environment for Mixed-Initiative Alternative Course of Action Analysis". This effort was aligned to our Human-Machine Teaming and Intelligent and Adaptive Aiding thrusts and had AFRL and the Navy Center for Applied Research in Artificial Intelligence involved in the work. We had several quality candidates, so please continue submitting. POC: Katie Smith, Strategic Analysis, Inc. ksmith@sainc.com

ASBREM COI State of the Science for Autonomous Medical Evacuation (AME) Workshop: On July 10–12, 2018, ASBREM hosted a State of the Science workshop on AME that brought together S&T subject matter experts from various Reliance 21 Communities of Interest, Service representatives, medical operators, combat developers, and acquisition and policy specialists. <u>Goal</u>: Identify near/mid /far-term research needs for an AME S&T portfolio that was coordinated across the various

research needs for an AME S&T portfolio that was coordinated across the various participating stakeholders. <u>Focus</u>: Identify medical needs to enable AME, develop a shared understanding of capabilities and research objectives, characterize technical challenges and gaps, and identify opportunities for coordination and partnership across participating stakeholders. A report with findings and recommendations for follow on activities is forthcoming. POC: Jackie Mutai, jackie.c.mutai.ctr@mail.mil

Autonomy COI Hosted an Autonomy Software Architecture Workshop: On July 18-19, the Autonomy COI hosted a workshop on "Architectures for Autonomy" that was widely attended and well received. Led by Dr. Stuart Young, Army Research Lab, and Dr. Laura Hiatt, Navy Research Lab, the goal was to examine the characteristics of autonomy software architectures for the operation of autonomous systems from high-level planning through low-level control. The workshop included exploring the necessary or desirable characteristics of DoD autonomy architectures to promote reuse and investigate the benefits of principled architectures for autonomy. The workshop also explored necessary attributes of autonomy architectures from all points of view including: sensor fusion, planning and execution, world model, cognitive frameworks, swarms, cyber, test evaluation (TE), and verification and validation (V&V). The output of the workshop was intended to rekindle collaborations from previous Autonomy Research Pilot Initiative (ARPI) efforts, build new collaborations around the identified gaps, and inform future service investments including ARAP proposal submissions. POC: Charlene Stokes, cstokes@mitre.org



Clinical Skills Lab

Navy Labs Host HS COI Steering Group for Familiarization Visit: The Navy hosted the Human Systems COI Steering Group on August 28-29 for a tour of Navy-related research facilities in the Washington, DC area. They visited the Uniformed Services University Health Sciences (USUHS) Simulation Center which houses the Hybrid Sim lab, Clinical Skills lab, and Virtual Medical Environment Capabilities. Other sites visited were the National Intrepid Center of Excellence to observe cutting edge rehabilitation facilities for our warriors with Traumatic Brain Injury, and the Navy Research Lab, including the LASR Facility. Dr. Geiss thanked the Navy team for a very successful event that both raises awareness of COI capabilities and improves the potential for future partnerships. The next SG Familiarization Visit will be hosted by the Army

at Natick Soldier Research, Development and Engineering Center (NSRDEC), currently planned for early December. POC: Katie Smith, Strategic Analysis, Inc. ksmith@sainc.com

Major Annual Upcoming Events 2018/19				
COI Steering Group/All Hands				
ARAP Proposal Data Call	Nov			
I/ITSEC	Nov			
2019				
Reliance 21 Meeting	Jan			
NDIA S&ET Conference	Mar			
NDIA Human Systems Conference and Human Factors Engineering TAG	Apr			
Roadmap Review	May			
DoD Laboratory Day	Jun			
Seedling Proposal Data Call	Jun			
IR&D Technical Interchange	Jun			





COI HIGHLIGHTS - Past Events (Continued)

Advanced Distributive Learning (ADL) iFest: In August, more than 275 people attended iFEST, an annual conference focused on advanced distributed learning and organized by the National Training and Simulation Association (NTSA) with collaborative inputs from the ADL Initiative. *Focus:* The Future Learning Ecosystem, which called members from industry, academia and government to act and collaborate with each other to find seams of efficiency and ideas for enhancement of training and education in the future. *Key Sessions:* 1) Posters, with more than 15 research groups presented on their projects related to the future learning ecosystem; 2) Speakers, more than 60 presented tutorials, panel discussions, workshops, and paper presentations on topics related to learning data and analytics, interoperability, and learning science; and 3) Special Panels with key leaders on topics such as personnel issues and removing barriers from implementing new technologies. iFEST 2019 is expected to again be held in Alexandria, VA in August. POC: Sae Schatz, sae.schatz@adlnet.gov

Army Research Institute (ARI) Personnel Testing and Performance Portfolio: Dr. Alisha Ness from ARI was the invited speaker at the Personnel Testing Council Metropolitan Washington, August meeting. She is on the Basic Research Team at ARI whose mission is to drive scientific innovation to enable the Army to acquire, develop, employ, and retain professional Soldiers and enhance personnel readiness. Her team also supports ARI's mission with foundational research across five research portfolios: Personnel Testing and Performance; Leader Development; Learning in Formal /Informal Environments; Organizational Effectiveness; and Culture. Dr. Ness's presentation on Personnel Testing and Performance was heard by a variety of industries to include government, academia, and private industry and will both increase visibility of ARI's Basic Research Program and generate new and innovative research ideas across the portfolios.

COI HIGHLIGHTS - "Next Up "

New Applied Research for the Advancement of S&T Priorities (ARAP) Proposal Timeline: The new data call date for FY19 ARAP White Papers is now two months earlier, on 1 November 2018. Other key dates are White Papers due December 2018, Proposals due March 2019, and a public announcement at 2019 DoD Lab Day, currently planned for 25 April 2019. POC: Katie Smith, Strategic Analysis, Inc. ksmith@sainc.com

HS COI Steering Group Meeting and All Hands: Scheduled for Oct 24-25 at ADL's CoLab, Mark Center. The meeting's major objectives are: 1) review COI FY18 accomplishments, 2) discuss FY19 strategy and 3) increase the potential for new collaboration opportunities. Key agenda items include a Steering Group Panel with Service updates, subarea roadmap discussions, and presentations from our partners and stakeholders to highlight mutual areas of interest. More information to follow from POC Katie Smith, Strategic Analysis, Inc. ksmith@sainc.com

Inter-service/Industry Training, Simulation and Education Conference (I/ITSEC): The conference is scheduled for 26-30 November 2018 in Orlando Florida. The COI intends to provide strong attendance to I/ITSEC in it's role as the premier Modeling & Simulation and Training Conference. POC: Katie Smith, Strategic Analysis, Inc. ksmith@sainc.com NDIA Human Systems Conference and Human Factors Engineering Technical Advisory Group (HFE TAG) Co-Locate in Apr 2019: Mark your calendars for two important events in the Human Systems community! The NDIA Human Systems Division (HSD) and the DoD HFE TAG will co-locate their conferences at Aberdeen Proving Ground, MD during the week of 15-19 April 2019. While these are two separate conferences, we will have a joint session on Tuesday 16 April to enable the DoD Human Systems Community of Interest to present its mission and roadmaps. This will include a session to engage the COI, TAG, and HSD in discussions on Human Systems issues and look for opportunities for collaboration with industry and across DoD. More information for both conferences will be coming your way soon!

POC: Dr. Jared Freeman, Aptima, freeman@aptima.com

HS COI Independent Research & Development (IR&D) TIM: This is a biennial HS COI IR&D event, next scheduled for June of 2019 with the purpose of jointly reviewing industry IR&D efforts for potential collaboration with the government. Next year's IR&D event will be hosted by both the HS COI and the ASBREM COI as a way to work together more effectively. Expect an invitation out to industry to solicit nominations in Nov 2018, with March 2019 as a target for the COI team to make their final selections of companies they want to hear IR&D presentations from. POC: Al Livada, 711 HPW, alan.livada.ctr@us.af.mil





International Corner

HS COI Science Selected as First International Topic for New DoD BARI Award: The inaugural use of the new Bilateral Academic Research Initiative (BARI) program created by DoD Basic Research Office is focused on advancing novel research involving Human-Machine sciences at universities within the US and UK. Topics for this program were discussed in the Feb 2018 Stocktake meeting chaired by Drs. Bindu Nair (US) and Kate Griffin (UK) during a breakout session to create the best human system science concepts to pursue. BARI programs have academic leads in both countries. The awarded team is led by Dr. Maryam Shanechi at the University of Southern California for the U.S. and Dr. Riccardo Poli at the University of Essex for the U.K. The award was created in the spirit of the US DoD multi-university research initiative (MURI) program where all services have vested interests. Please visit the BARI site at (https://basicresearch.defense.gov/Pilots/BARI-Bilateral-Academic-Research-Initiative/) for more information. POC: Dr. John Schlager, 711 HPW, john.schlager@us.af.mil.

Wearable Assistive Technologies International Research Roadmap Workshop: Natick Soldier Research, Development and Engineering Center (NSRDEC) Soldier Performance and Optimization Directorate attended a July Wearable Assistive Technologies International Research Roadmap Workshop via the Technical Cooperation Program (TTCP) Human Resources and Performance Group (HUM) JP-1 HSP-Land Activity titled, "Human-centered Design of Wearable Assistive Technologies for Dismounted Combatants." Partners from Canada, Australia and the United Kingdom were in attendance and the workshop was instrumental in facilitating the development of the overarching international exoskeleton roadmap and in identifying collaborative program/project areas of research that can be leveraged. Meeting attendees will update the International Exoskeleton Roadmap, establish quarterly program status update meetings, and present the workshop results at the larger TTCP HUM JP-1 meeting being hosted by NSRDEC in September, 2018. POC: Karen Gregorczyk, NSRDEC, karen.n.gregorczyk.civ@mail.mil.

Laser Exposure Ocular Effects Project Agreement Success: AFRL and UK partners continue to define/refine models that address safe levels of laser exposure and predicts effects of laser dazzle on human vision. This work has been used to create new operational Nominal Ocular Dazzle Distance (NODD) and Maximum Dazzle Exposure (MDE) assessments for predicting exposure limits used to avoid ocular damage and conditions that cause temporary vision loss due to dazzle effects. Tools produced predict effective dazzle distances, meet protective eyewear requirements, and have created multiple publications including being added as content to the next edition of the American National Standards Institute (ANSI) Z136.6 "Safe Use of Lasers Outdoors". POC: Dr. Leon McLin, 711 HPW, leon.mclin@us.af.mil.

Biodynamic Database and Research Exchange Project Agreement Activated: AFRL researchers have initiated a partnership with the UK to advance investigations involving biodynamic human stressors focused on improved development of ejection injury criteria and spinal injury models to better predict and mitigate aircrew injury during ejection from aircraft. The work includes advancing the development of a comprehensive ejection database to generate improved injury prediction models for use in assessing spinal injury risk due to new ejection seat deployment, aircrew population variation, and operational personnel equipment use. Expanded data sets will enhance current finite element models and mathematical human injury models for aircraft seat ejection. The Project Agreement is active until April 2025. POCs: Casey Pirnstill, casey.pirnstill@us.af.mil and John Buhrman, 711 HPW, john.buhrman@us.af.mil

Upcoming Human Factors and Medicine (HFM) NATO Symposium on Autonomy: A quick reminder for the HFM-300/RSY, Symposium on Human Autonomy Teaming occurring 15-17 Oct 2018 in the UK. AFRL is leading the Symposium addressing human-autonomy teaming and human automation cooperation from the perspectives of the overall system, technological factors, human factors, operational issues and corresponding legal and ethical questions. The domain topics include ground, air, sea, space and cyber, and bridging science with applications and operations. POC: Dr. Mark Draper, Symposium Chair, 711 HPW, mark.draper.2@us.af.mil.





COI HIGHLIGHT: 2018 National Defense Strategy Summary

https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf The 2018 National Defense Strategy articulates a strategy to compete, deter, and win in an increasingly complex security environment defined by rapid technological change, challenges from adversaries in every operating domain, and the impact on current readiness from the longest continuous stretch of armed conflict in our Nation's history. It goes on to mention the reemergence of long-term strategic competition, rapid dispersion of technologies, and new concepts of warfare and competition spanning the entire spectrum of conflict require a Joint Force structured to match this reality. Finally, it is further believed force posture, alliance and partnership architecture, and Department modernization will provide the capabilities and agility required to prevail in conflict and preserve peace through strength.



Continuation of commentary by Dr. Ben Petro, Acting HS COI OSD Lead.

I would like to outline some important COI efforts aligned with the three priority lines of effort mentioned in the Strategy.

1) <u>Restore military readiness for a more lethal force</u>

Given the demands of modern military operations and the steady battle rhythm of the past two decades, the Department is looking for new ways to ensure continued fielding and sustainment of a lethal and survivable force that can defeat all adversaries. Optimized warfighter systems and performance is a critical complement to major weapons systems in achieving overmatch.

Balancing lethality and survivability will be essential for the extreme environments of combat, such as those experienced by pilots, divers, and those operating in mountainous regions or at temperature extremes. It will also be a key challenge in the developing battlespaces of cyber warfare, space, and autonomous warfare, where intuitive human-machine interfaces will play increasingly larger roles.

HS COI members are laying the foundation for such capabilities as our research is enabling next-generation sensors, training methods, body armor, rations and performance nutrition, techniques for performance optimization, and sustained mission readiness in austere and extreme environments.

One recent example is the Monitoring and Assessing Soldier Tactical Readiness and Effectiveness (MASTR-E) project that the Natick Soldier Research Development and Engineering Center is spearheading in partnership with the 82nd Airborne and a number of other HS COI members. MASTR-E is leveraging cutting-edge technology and a wide array of technical disciplines to identify the human performance x-factors that reliably account for sustained dismounted soldier and squad lethality.

Strengthening lethality is of such importance to Secretary Mattis, that earlier this year he established the Close Combat Lethality Task Force (CCLTF) to advise him on policy and programmatic opportunities to maximize squad lethality and achieve decisive near-peer overmatch by FY22. The HS COI has been invaluable in fulfilling the CCLTF's requirements for data on DoD S&T investments relevant to their mission. Thanks to HS COI responsiveness, the CCLTF is interacting with a number of DoD laboratories and advocating for acceleration of a number of our research initiatives at the highest levels in DoD.

2) Strengthen alliances and attract new partners

Global security is enabled by strategic partnerships that are balanced and sustained over time. As the underlying technologies that drive military innovation increase in complexity and variety, close and continuing partnership with our allies is essential to the information-sharing and technology transfer that is needed for us to achieve true interoperability in the multi-domain battlespace.

The HS COI members have a strong track record of fostering productive science and technology collaborations with allies and partner nations, to include military as well as civilian organizations. In addition to sustaining support for bilateral and multilateral fora, such as the North Atlantic Treaty Organization's Human Factors and Medicine Panel, the HS COI is always keen to explore new opportunities for innovative partnership. This was evident in the strong level of preparation and participation HS COI members contributed to a bilateral discussion with the United Kingdom our office hosted earlier this year to identify opportunities for new joint projects in the human systems domain.





COI HIGHLIGHT 2018 National Defense Strategy Summary (Continued)

3) Bringing business reforms to DoD

Lethality is the hallmark of effective warfighters; however, for sustained success over the long haul, they also need the technology development and acquisition processes that support them to be efficient and effective in delivering solutions designed around their needs and limitations. Advancing principles of human-centered design across all warfighting platforms is a core competency of the HS COI that is unmatched.

Many of the HS COI member organizations have human systems integration (HSI) professionals that directly engage with program managers for all major weapons systems. Leveraging the knowledge generated through HS COI research, these HSI professionals are providing advice and recommendations for system development that avoid costly system reconfigurations or catastrophic accidents. The HS COI is actively strengthening collaboration between the research, HSI practitioner, and policy communities by participating in key fora such as the annual Human Factors Engineering Technical Advisory Group (HFE-TAG) meeting and the DoD Joint Human Systems Integration Steering Committee (JHSISC).

The 2019 HFE-TAG meeting in Aberdeen, MD will provide a unique opportunity to further bridge these communities as the agenda will feature plenary and break-out sessions for the HS COI Sub Areas and JHSISC Working Group. The meeting will be co-located with the National Defense Industry Association's annual Human Systems Conference to expand members' participation with both their government and industry colleagues. I encourage all who are interested to attend.

OTHER COI ACCOMPLISHMENTS

Applied Research Supports Inaugural RED FLAG - RESCUE: The Air Force Research Laboratory assisted with the capture of lessons learned at the first-ever REDFLAG—RESCUE (18-2) exercise hosted at Davis-Monthan AFB by the 414th Combat Training Squadron. This effort enabled AFRL to adapt common tools for evaluating training effectiveness to the domain of personnel recovery. The RED FLAG event also served to highlight many lessons learned and will ultimately enable growth for training, including lessons about scenario development and technologies to enable scenario execution and post-scenario debrief and feedback. POC: Ms. Jennifer Winner, 711 HPW, jennifer.winner.1@us.af.mil.



USAF's Battlefield Airman (BATMAN) Program Showcased at Joint Terminal Air Control (JTAC) Training Event: Members from AFRL's 711th Human Performance Wing (711 HPW) participated in live close-air-support training activities with Joint Terminal Air Controllers (JTAC) at the Weapons Instructors Course. The annual event coincides with JTAC certification events and provides BATMAN researchers a unique opportunity to evaluate new technologies in development. "BATJAM", one of two technologies being evaluated, is a low-power, micro-jammer designed and built by BATMAN that will allow JTAC instructors a means to increase realism in their training by providing jamming to GPS and radio frequencies at will. Additionally, a Micro-Cooling Vest (MCV) is being evaluated and is designed to integrate into operators' load bearing vests and powered by a tactical radio battery. The MCV is being developed under a Small Business Innovative Research (SBIR) sponsored by AFSOC. POC: Mr. Michael Sedillo, 711 HPW, michael.sedillo.1@us.af.mil.

AFRL/711 HPW Paper on Human-Machine Teaming in the Institute of Electrical and Electronics Engineers (IEEE) Journal: Drs. Robert Patterson and Bob Eggleston, AFRL 711 HPW scientists, had a paper on human-machine teaming published in the journal, IEEE "Transactions on Emerging Topics in Computational Intelligence". The paper was entitled "Human-Machine Synergism in High Level Cognitive Functioning: The Human Component" and was published in a special issue on human-machine symbiosis. <u>Key Issues</u>: 1) common meaning making—for high-level cognitive synergism, both human and machine should make the same meaning of common or correlated objects and events; and (2) common expertise development—having both human and machine develop common expertise would be one way to create common or correlated meaning making. The development of construed, grounded relations among objects and events within the domain of expertise in which they operate. Techniques employed in evolutionary robotics could be used to create common expertise development and, therefore, common meaning making. POC: Dr. Robert Patterson,711 HPW, robert.patterson.22@us.af.mil Airmen Safety Action Program: The Air Force Research Laboratory, in collaboration with Air Mobility Command, is working to improve fatigue risk management for current and future mobility operations. The Command implements an Aviation Operational Risk Management (AvORM) program which aids mission schedulers and aircrews in identifying and mitigating flight risks. AvORM automatically scores operational hazards based on available mission data and allows the initial planner, current operations, squadron leadership, and aircraft commander to score operational hazards and personal risks. The program also utilizes a scheduling tool and

underpinning bio-mathematical fatigue model to predict aircrew performance effectiveness throughout the mission. Although the AvORM program highlights and mitigates potential flight risks, human fatigue continues to impact safety, suggesting an ongoing need for improved fatigue risk management and mitigation. The researchers are using this assessment in conjunction with activity data collected from aircrews during missions to better understand this community's fatigue issues and inform policy decisions that better manage and mitigate risk.

POC: POC: Dr. Glenn Gunzelmann, 711 HPW, glenn.gunzelmann@us.af.mil.

AFRL/711 HPW Conducted Confined Space Monitoring System Field Test: A combined Air Force and contractor team conducted field testing of the current prototype system during actual confined space work performed at Warner Robbins Air Logistics Center (WR-ALC). Testing was performed with a total of six entrants and up to three simultaneous entries. All system components were tested, including wearable physiological monitoring, wireless continuous atmospheric monitoring via a handheld, user interface (a smartwatch device), and remote monitoring displays and interfaces. The system successfully and continuously monitored all entrants, with good connectivity and positive feedback regarding sensor position, comfort, and user interface. The next major milestone is expected to expand system testing to all confined space work, mature the prototype with flexible hybrid electronics, and test the supervisor functionality for remote entry approval. The project is on schedule to complete the development effort in approximately 12 months.

POC: Dr. James Christensen, 711 HPW, james.christensen.7@us.af.mil.

Learning through Electrical Augmentation of Plasticity (LEAP) project Demo - DARPA D60: The Air Force Research Laboratory has been working jointly with Wright State Applied Research Corporation to evaluate the effects of transcutaneous Vagal Nerve Stimulation (tVNS) on learning, attention, and arousal in support of the Targeted Neuroplasticity for Training (TNT) program — specifically investigating the effects on image analysis training. The LEAP project was designed to investigate methods to produce improvements in

training time, task performance, and skill retention via an optimized training protocol that leverages windows of increased neuroplasticity induced by tVNS. The initial study is currently systematically exploring neurostimulation parameters and the integration of neuro-stimulation into ISR training, focusing on the timing of stimulation (with respect to training epochs) as well as stimulus frequency. The initial study is now complete and the results are extremely promising. The team is now performing a follow-up to examine additional stimulation parameters. POC: Dr. Richard McKinley, 711 HPW, richard.mckinley.2@us.af.mil.

AFRL/711 HPW Scientists Publish Manuscript on Sweat as Non-Invasive Medium for Monitoring Human Performance: A manuscript entitled "The Proteomic and Meta-bolomic Characterization of Exercise-induced Sweat for Human Performance Monitoring: a Pilot Investigation" was accepted into PLOS ONE (Public Library of Science) journal and outlines investigating sweat as a non-invasive medium for monitoring human performance. For the project, sweat was collected from active duty airmen performing a treadmill exercise program with the proteomic and meta-bolomic signatures of the excreted sweat compared across individuals as a baseline study of sweat content. Results highlighted the need for additional experiments to define the methodological aspects that influence analytical results to effectively monitor biomarkers in sweat in a well understood manner. This approach enhances 711 HPW initiatives for recognition and detection of non-invasive molecular signatures indicative of human performance, as well as development of point-of-care diagnostics for risk assessment and mission readiness within operational environments. POC: Dr. Jennifer Martin, 711 HPW, jennifer.martin.39@us.af.mil.

Community of Interest (HS COI) Newsletter

Human Systems







EXTENA









KEY EFFORT TO WATCH

Navy Life Game -- Towards a More Robust Model System of Navy Selection and Classification. The Office of Naval Research and Naval Education and Training Center have funded the University of California at Los Angeles Center for Research on Evaluation, Standards, and Student Testing to develop the Navy Life Game, a new research test-bed in the form of a prototype game. The primary goal is to provide potential Navy recruits exposure to the various types of jobs, duties, tasks, and missions that exist across different enlisted ratings, initially focusing on the Fire Controlman (FC) and Damage Controlman (DC) ratings. The game operates on two tiers: 1) access adventure game and 2) rating familiarization games. The access adventure tier is a fantasy game used as a means to motivate the player to engage in second tier Navy tasks and presents players with goals, tasks, and affordances constrained to authentic Navy contexts found in an actual ship environment. It incorporates game attributes such as action roleplaying in which the player must carry out various Navy job tasks and activities, e.g., extinguishing fires or activating a radar console. Data derived from players' interactions with these tasks will be analyzed through the use of innovative statistical models to provide insight into the future Sailor's interests and their relationship with task familiarity. The interest model will build on the JOIN (Job Opportunities in the Navy) inventory that asks a series of questions related to the environment and types of duties that might interest a potential recruit. Motivation: The Navy has realized the need to manage the expectations and interests of potential new recruits (e.g., Sailor 2025), many of whom make decisions to enlist in the Navy and choose particular job ratings without a clear understanding of the specific jobs and duties. Without a clearer view of job options and associated expectations, the Navy risks creating recruit dissatisfaction which may lead to attrition and additional costs to the Navy. The Navy Life Game effort is part of an overall modernization attempt for Navy Selection and Classification which includes collaboration with the Force of the Future Working Group from the Office of Secretary of Defense. POC: LCDR Pete Walker, ONR, peter.b.walker1@navy.mil





COI Contact Information

Human Systems COI – STEERING GROUP MEMBERS					
<u>Agency</u>	Position	<u>Name</u>	<u>E-mail</u>		
AF (COI Chair)	Director, Airman Systems Directorate 711 th Human Performance Wing, AFRL	Dr. Kevin Geiss	kevin.geiss@us.af.mil		
Army (Lead)	Director, Human Research and Engineering Directorate (HRED)- ARL	Dr. Corde Lane	Jason.c.lane8.civ@mail.mil		
Navy (Lead)	Div. Dir. (Code 341), Human & Bioengineered Systems	Dr. John Tangney	john.f.tangney@navy.mil		
SOCOM	Director, SOF AT&L Science & Technology	Ms. Lisa Sanders	Lisa.Sanders@socom.mil		
Navy	Department Head, Warfighter Performance, Code 34	Dr. Patrick Mason	Patrick.mason@navy.mil		
Army	Director, Army Research Institute (ARI)	Dr. Michelle Zbylut	michelle.l.zbylut.civ@mail.mil		
Army	Technical Director, Natick Soldier Research, Develop- ment and Engineering Center (NSRDEC/Natick)	Mr. Doug Tamilio	douglas.a.tamilio.civ@mail.mil		
USD(R&E)	Acting Human Performance, Training, and Biosystems Directorate (HPTB) Director	Dr. Ben Petro	james.b.petro.civ@mail.mil		
Human Systems COI – HPT&B SUPPORT					
USD(R&E)	Contract Support (Strategic Analysis)	Dr. Cyan James	cyan.r.james.ctr@mail.mil		
OUSD(R&E)	HPT&B Staff	Dr. Tamara Chelette	tamara.l.chelette.civ@mail.mil		
Human Systems COI – WORKING GROUP MEMBERS					
AF - Chair	Chief, Strategic Planning and Transformation 711th Human Performance Wing (WPAFB)	Dr. Todd Nelson	william.nelson.35@us.af.mil		
Army	Chief, Programs, Budget, and Strategy, ARI	Dr. Marty Bink	martin.l.bink2.civ@mail.mil		
Navy	Naval Postgraduate School	Dr. Paul Chatelier	pchat@mindspring.com		
USD(R&E)	Associate Director, Human Systems, HPT&B	CDR Jeffrey Alton	jeffrey.d.alton4.mil@mail.mil		
Army	Natick/NSRDEC (MA)	Ms. Karen Gregorczyk	karen.n.gregorczyk.civ@mail.mil		
Army	Senior Campaign Scientist, Human Sciences	Dr. Kelvin Oie	kelvin.s.oie.civ@mail.mil		
Navy	Human & Bioengineered Systems Code 34	LCDR Pete Walker	peter.b.walker1@navy.mil		
Army	TAD, Office of the Dir. HRED, ARL	Ms. Jody Wojciechowski	josephine.q.wojciechowski.civ@mail.mil		
Human Systems COI – Contractor Support					
USD(R&E)	Contract Support (Strategic Analysis)	Ms. Katie Smith	ksmith@sainc.com		
USD(R&E)	Contract Support (MITRE Corp)	Dr. Carolyn Parish	cparish@mitre.org		
AFRL	Contract Support (Loch Harbour)	Mr. Al Livada	alan.livada.ctr@us.af.mil		
AFRL	Contract Support (Loch Harbour)	Dr. Jill McQuade	jill.mcguade.2.ctr@us.af.mil		





Human Systems COI – SUB-AREA LEADS & MEMBERS					
Personalized Assessment, Education, and Training (PAE&T)					
AF - Lead	711 HPW/RHA	Dr. Glenn Gunzelmann	glenn.gunzelmann@us.af.mil		
Army (ARI)	Army Research Institute (Ft Benning)	Dr. Marty Bink	martin.l.bink2.civ@mail.mil		
Navy (NRL)	Associate Director, Human Systems, HPT&B	Dr. Mark Livingston	mark.livingston@nrl.navy.mil		
Army (ARL)	Army Research Labs (NSA Orlando)	Mr. Rodney Long	rodney.a.long3.civ@mail.mil		
DLNSEO	Defense Language, Nat'l Security Education	Dr. Michael Nugent	michael.a.nugent22.civ@mail.mil		
ADL	Director, Advanced Distributive Learning	Dr. Sae Schatz	sae.schatz@adlnet.gov		
USMC	S&T & Future Learning Group Lead, TECOM	Dr. Kendy Vierling	kendy.vierling@usmc.mil		
Navy	Naval Air Warfare Command, Training Systems	Dr. Jim Pharmer	james.pharmer@navy.mil		
DODHRA	DOD Human Resources Activity,	Dr. Shannon Salyer	shannon.d.salyer.civ@mail.mil		
CTTSO	Combatting Terrorism Technical Support Office	Dr. Eric Sikorski	eric.sikorski@cttso.gov		
Protection. Sustainment and Warfighter Performance (PSWP)					
Navy - Lead	ONR (NCR)	Dr. Peter Squire	peter.squire@navy.mil		
Army - Lead	ARL - HRED	Dr. Michael LaFiandra	michael.e.lafiandra.civ@mail.mil		
AF	711 HPW/RHD (TX)	Ms. Roxanne Constable	winona.constable@us.af.mil		
Army	Natick/NSRDEC (MA)	Dr. John Ramsay	karen.n.gregorczyk.civ@mail.mil		
AF	711 HPW/RH (OH)	Dr. John Schlager	john.schlager@us.af.mil		
Navy	SPAWAR	Dr. Karl Van Orden	karl.vanorden@navy.mil		
AF	711 HPW/XPT	Dr. Tom Lamkin	thomas.lamkin@us.af.mil		
DARPA	DSO	Dr. Adam Russell	adam.russell@darpa.mil		
AF	711 HPW/XPT	Mr. John Guillen	john.guillen.1@us.af.mil		
	System Interfaces and	Cognitive Processing	(SICP)		
AF - Lead	711HPW/XP (WPAFB)	Dr. Todd Nelson	william.nelson.35@us.af.mil		
AF	711 HPW/RHC	Dr. Mark Draper	mark.draper.2@us.af.mil		
AF	711 HPW/XPT	Mr. Ed Davis	edgar.davis@us.af.mil		
AF	711 HPW/XPT	Mr. John Guillen	john.guillen.1@us.af.mil		
AF	711 HPW/RHC	Dr. Erica Johnson	erica.johnson.7@us.af.mil		
Army Lead	RDECOM	Dr. Caroline Mahoney	caroline.r.mahoney.civ@mail.mil		
Navy	ONR Code 341	Dr. Tom McKenna	tom.mckenna@navy.mil		
AF	711 HPW/XPT	Mr. Jeff Palumbo	jeffrey.palumbo.1@us.af.mil		
Army	ARL – CISD	Dr. Elizabeth Bowman	elizabeth.k.bowman.civ@mail.mil		
Navy	Office of Naval Research	Dr. Rebecca Goolsby	rebecca.goolsby@navy.mil		
AF	711 HPW/RHX	Mr. Eric Hansen	eric.hansen.5@us.af.mil		
AF	711 HPW/RHX	Dr. Laurie Fenstermacher	laurie.fenstermacher@us.af.mil		
Navy	NAWCTSD	CDR Hank Phillips	henry.phillips@navy.mil		
Army	ARO	Dr. Edward Palazzolo	edward.t.palazzolo.civ@mail.mil		
Army	RDECOM	Dr. David Scribner	david.r.scribner.civ@mail.mil		
Army	ARO	Dr. Lisa Troyer	lisa.l.troyer.civ@mail.mil		
DARPA	DSO	Dr. Adam Russell	adam.russell@darpa.mil		