




Human Systems Community of Interest Quarterly Newsletter





Oct 2017

FROM THE EDITOR: This is our inaugural newsletter, and we have a goal of increasing interest and participation in the Human Systems COI. How will we do that? Hopefully by providing insight into the great people, valuable work and important collaboration opportunities the COI gives to Scientists, Engineers and other Human System practitioners. Please stay in touch and help us make this a forum that can become a “go-to” place for important COI information!

HAIL & FAREWELL

 Welcome to our newest HS COI Steering Committee Member, Lisa R. Sanders, Director of Science and Technology for Special Operations Forces, Acquisition, Technology & Logistics (SOF AT&L), U.S. Special Operations Command (USSOCOM), MacDill Air Force Base, Florida. Ms. Sanders has over 30 years of civilian Federal service. Though she is responsible for all science & technology activities at the command, Ms. Sanders’ primary focus is integrating science & technology efforts across the SOF enterprise. This includes ensuring capability gaps are aligned with technology enablers and developers, integrating ongoing efforts with transition partners, identifying additional innovation required to address S&T gaps, and assessing disruptive technology solutions for their impact and potential benefit to the SOF mission set.

 Hail to Dr. Geiss. As of 1 Oct, Dr. Geiss is the new Chair of the Human Systems COI having been the Air Force Lead to the COI the past two years. He is currently the Director of the Airmen Effectiveness Directorate, 711th Human Performance Wing, Air Force Research Laboratory.

 Farewell to Dr. Tangney. We’d like to thank Dr. Tangney for another successful tenure as Chair of the HS COI. Under his leadership, we have continued to lead the way in our outreach efforts to industry through NDIA and IR&D events, significantly improved products requested by ASD(R&E) such as our roadmaps and joint programs, and continued the vision of the HS COI as the premiere community to measurably improve Mission Effectiveness. He will continue as the Navy Lead.

OUR HUMAN SYSTEMS COI

Overall: One of 17 COIs OSD created as a framework to better coordinate key decisions between DoD and S&T community. Goal: Make COIs a “go-to” source for DoD S&T expertise, leadership and coordination.

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

Mission: 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 and 5) Mastering the PMESII battle space.

Key Products: 1) Integrated OSD and Service Roadmaps, 2) COI Taxonomy, Budget and Programs and 3) COI Collaboration Opportunities, Accomplishments and Capability impacts.

Data Links: Key information on the COI can be found at the Marketplace website: <http://www.defenseinnovationmarketplace.mil/coi.html>



Key Personnel

OSD Chair: Dr. Bindu Nair (acting)	OSD
COI Chair: Dr. Kevin Geiss	AFRL
Navy Lead: Dr. John Tangney	ONR
Army Lead: Mr. John Lockett	ARL
Army Lead: Dr. Michelle Sams	ARI
Army Lead: Mr. Doug Tamilio	NSRDEC
WG Chair: Dr. Scott Galster	AFRL
PAE&T Lead: Dr. Glenn Gunzelmann	AFRL
SICP Lead: Dr. Todd Nelson	AFRL
PSWP Lead: Dr. Peter Squire	ONR
HI3 Lead: Dr. Liz Bowman	ARL

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



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COI HIGHLIGHTS (EVENTS)

The schedule shows major events and activities the COI will participate in over the course of the year. For most of the major events, we'll go back a quarter and give a summary; for next quarter's events we'll provide a "heads-up".

DoD Lab Day 2017 - Held at the Pentagon Courtyard, Lab Day featured more than 100 displays highlighting selected technologies from the laboratories and engineering and warfare centers. The theme was "Solving Problems Today, Designing Solutions for Tomorrow". HS COI had their poster on display and several organizations had key exhibits. (POC: Katie Smith)

COI Roadmap Review - OSD created a new roadmap review approach and reporting cycle where each COI briefs their roadmap as a deliverable to the Deputies Council instead of the S&T EXCOM. The Human Systems COI review in May successfully met guidance from Mr. Ormond for S&T leadership to communicate organization, coordination, and lack of duplication in the S&T budget at the Tier 1/2 taxonomy levels. Other major feedback was to provide better emphasis on military capability in our roadmaps and assist the ASBREM COI in updating their roadmaps for next cycle. (POC: Katie Smith)

HS COI IR&D TIM - Our third bi-annual Human Systems Independent Research & Development TIM from 20-23 Jun 17 was attended by over 100 key Government and Industry representatives. The event's purpose was to jointly review industry efforts for potential collaboration – this round, it was 44 technical efforts from 19 companies with an approximate funding of \$30M. Industry's response was again overwhelmingly positive to our face to face discussions. They appreciated the energy and breadth of our teams in addition to quick, insightful feedback on the potential for future collaborations. We tallied 132 concrete actions to work with industry, to include future meetings, site visits, demos, and data exchanges, not to mention the potential for CRADAs or other proposals. This was the culmination of many months of planning and execution, and would not have been possible without the hard work of our subareas with their COI team members, and our strategic partners. Many thanks also to Strategic Analysis and the AFRL IR&D team for their outstanding planning and execution of the event. (POC: Al Livada)

COI Steering Group/All Hands Meeting - Held 7-8 Sept in Wash DC, the meeting successfully achieved the objectives to review the COI's FY17 progress and determine our FY18 strategy. We discussed where the services were going, received an update on all four subareas, and reviewed key efforts of our various partners and stakeholders for potential collaborations. An important outcome was an outline of various workforce development areas that will guide future COI ARAP proposals. (POC is Katie Smith)

Major Annual Events/Activities	
Reliance 21 Meeting	Jan
ARAP Proposal Data Call	Jan
COI Information Exchange	Feb
NDIA Human Systems Conference	Mar
NDIA S&ET Conference	Apr
HFE TAG	May
DoD Lab Day	May
COI Roadmap Reviews	May
Seedling Proposal Data Call	Jun
HS COI IR&D TIM (Bi-annual)	Jun
COI Steering Group/All Hands	Sept
I/ITSEC	Dec



"Heads-up"

Inter-service/ Industry Training, Simulation and Education Conference (I/ITSEC) - I/ITSEC is the premier Modeling & Simulation and Training Conference, and we want to continue the COI's record of excellent attendance. The COI is not hosting a panel as it did last year, but will hold a meeting with Subareas if enough attend the event. (POC: Katie Smith)

NDIA Human Systems Division Conference - Will be held at the Waterford in Springfield VA, March 13-14, 2018. This is a great opportunity to connect with government, industry, and academic leaders from the human systems community who share an interest in advancing the field through education consultation, future research and collaboration opportunities.

- ⇒ Now accepting abstracts for the conference which can include presentations, posters or demonstrations at <http://www.NDIA.org/HumanSystems18>. Website also for registration and hotel information.
- ⇒ Conference theme is Human Systems in Emerging Domains: Autonomy, Human Augmentation and Cyber
- ⇒ POC: Andrea Lane at alane@ndia.org or (703) 247-2554



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COI HIGHLIGHTS (ACTIVITIES)

Applied Research for the Advancement of S&T Priorities (ARAP) - Annual data call from ASD(R&E). Efforts can range from expansion and application of basic research to design and development of prototypes. Duration is three years, with funding not to exceed \$15M per year. OSD selects 1-2 per cycle. The HS COI candidates were:

- ⇒ PAE&T: Biotechnology for Increasing Realism in Simulation and Training
- ⇒ SICP: The Warfighter's Associate
- ⇒ PSWP: Wearables for Warfighter Dominance
- ⇒ HI3: Dynamic Adaptive Visualizations of INTERactive Complex Intelligence (DaVinci)

The HS COI's nominee from PSWP was not selected by OSD. (POC: Dr. Michael Lafiandra or Dr. Peter Squire)

Seedling Proposal - Seedlings are 2 year programs, \$500k-\$1m/year, and high impact opportunities that cut across the Components. Candidates for the HS COI proposal were:

- ⇒ PAE&T: Trainable Undifferentiated Agents for Rapid Constructive Force Generation
- ⇒ SICP: Context-Aware Communication for Human-Machine Teaming Performers
- ⇒ HI3: Combat Rumor Counter-narrative submitted with C4I Trainable Undifferentiated Agents for Rapid Constructive Force Generation (Submitted with C4I)

The COI nominee from PAE&T was not selected by OSD. (POC: Dr. Glenn Gunzelmann)

COI PB 18 Data Call - Annual OSD tasker where Mission Organizations update binning against the COIs/Sub-areas at the PE/Project (BPAC)/Thrust level. This provides the COIs more accurate information on projects in their area of responsibility and informs their roadmap development. Spreadsheet product will be sent to the COIs when complete. (POC: Katie Smith)

Advanced Distributed Learning (ADL) iFest - Congratulations on a successful iFest in August. For those of you who missed it, you can view presentations that are available at <http://www.adlnet.gov/ifest-2017-schedule>. (POC: Katie Smith)

COI ACCOMPLISHMENTS

The HS COI briefed the following major accomplishments and notable efforts to senior ASD(R&E) staff earlier this year via the COI Update, COI Roadmap Review and COI poster which can be found at the Marketplace website.

- Joint Air Force/Navy MIL-STD 3050 on On-Board Oxygen Generation Systems (OBOGS) currently being applied to the next generation trainer TX and all future aircraft using OBOGS systems
- Transitioned standards for physical augmentation device measurement to developers, DARPA Warrior Web and SOCOM TALOS, and NIST for application beyond DoD
- Battlespace Acoustics Laboratory collected F-35B noise data aboard the LHA-6, USS America in support of F-35 JPO
- Completed assessment of the Pilot Physiological Monitoring and Warning System as a predictor of cognitive deficits during hypoxia exposures. AF and Navy flight demonstrations planned for early 2017 - flight helmet integrated physiological monitoring and warning system has transitioned into next generation Digital Joint Helmet Mounted Cueing System (JHMCS).
- Human Factors for Laser Eye Protection data collected enabled transition of technology to SPO
- Fleet Synthetic Training (FST) participated in Rim of the Pacific Exercise, Operation Blended Warrior (held during Inter-service/Industry Training, Simulation, and Education Conference (I/ITSEC)), FST-M, working with Tactical Training Group, Pacific to develop FST-RDT&E for FY17

Personalized Assessment, Education, and Training	System Interfaces and Cognitive Processes
Right Person, Right Job, Right Skills <ul style="list-style-type: none">• Evolving Strategies for Training Design• Personnel Selection and Assignment 	Effective, Natural Human-Machine Teaming <ul style="list-style-type: none">• Human-Machine Teaming• Intelligent, Adaptive Aiding 
Protection, Sustainment, and Warfighter Performance	Human Information Interpretation & Influence (HI3)
Ensuring Warfighter Safety and Survivability <ul style="list-style-type: none">• Understanding and Quantifying Warfighter Variability• Enhancement and Mitigation Strategies 	Our Forces Prepared for Global Challenges <ul style="list-style-type: none">• Understanding Others' Information Campaigns & Developing Influence COAs• Integrate Common Social Analytics Workflow into Multi-Domain C2 Systems 



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COI ACCOMPLISHMENTS (Continued)

- IMPACT DoD Virtual Lab allowed one operator controls 12 vehicles – force multiplier, lauded by OSD as Autonomy Research Pilot Initiative (ARPI) poster child
- Advanced technologies for Battlefield Airman (BATMAN) resulted in 30 tech transitions to Special Tactics operators in advanced audio/visual communications and lightweight equipment, mission rehearsal, and multi-patient monitoring. Transitioning Battlefield Airmen Trauma Distributed Observation Kit capability to Army and joint medical community.
- Augmented Immersive Team Training (AITT) provided a unique JTAC training capability for Joint Staff exercises. Scheduled to transition to multiple Marine Corps programs.
- Multiple Live Virtual Constructive (LVC) product transitions; Deployable LVC baseline, Learning Management SOA Advanced Technology Demonstration completed
- Generalized Intelligent Framework for Training transitioned to 900 users in 53 countries
- Supported NATO Information Technology effort for Humanitarian Assistance and Disaster Relief. Exercised research and COTS analysis tools for NATO Brilliant Jump 16 and Poland/US exercise Anakonda 16.

Subarea ACCOMPLISHMENTS

Personalized Assessment, Education & Training

- Technical specification to facilitate standardized documentation and interoperable communication of learning experiences & data across training environments and systems
- Secure LVC Advanced Training Environment (SLATE) developed new waveform for LVC data transmission, enhanced range infrastructure to support LVC integration, and created new standards, data specifications, and interface control docs to support 4th & 5th gen LVC
- Predictive Performance Optimizer (Patent No. 61/387,031; 2013, 2014) uses quantitative models of human learning and forgetting to optimize training schedules for individuals; current demonstration in collaborative venture with the American Heart Association and Laerdal for scheduling CPR training for medical professionals.

Systems Interfaces & Cognitive Modeling

- Control Station Human Machine Interface (CaSHMI) program demo'd at Annual Naval Technology Exercise; supervisory control of a Blackwing UAS and multiple Iver UUVs; transitioned to NAVSEA PMS-425: AN/BYG-1 Submarine Combat System (APB-17) and NAVAIR PMA-281: Unmanned System Common Control System (CCS).
- Cognitive Assessment Metrics and Emerging Reality Augmentation (CAMERA) program completed pilot studies to establish test methodology for means to collect physiological metrics to assess the impact of SA technologies on soldier cognitive workload
- Autonomy Research Pilot Initiative: Realizing Autonomy via Intelligent Adaptive Hybrid Control increased the robustness and transparency of autonomous control for multiple unmanned systems

Protection, Sustainment, & Warfighter Performance

- Aerospace Physiology & Toxicology effort to develop in-flight hypoxia monitoring & warning system and joint service standard for onboard oxygen generation systems that addresses safe-to-fly needs for current and next generation aircraft
- Soldier Systems Engineering Architecture effort identified and developed human performance measures of merit to inform interaction among factors affecting mission performance
- "Soldier Equipment Configuration Impact on Performance: Establishing a Testing Methodology for the Assessment of Clothing and Individual Equipment (CIE)" used operational scenarios to determine effects and trade-offs of CIE on cognitive and physical performance
- Established methodologies/standards to evaluate efficacy of wearable augmentation devices on Warfighter performance



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Subarea ACCOMPLISHMENTS

Human Information, Interpretation, and Influence

- Language neutral coding to forecast violent events in Spanish & Arabic saved time/money and enabled anticipatory analysis in demonstrations
- Deep Neural Networks applied to speech recognition tasks improved conversational & noisy environment translations, enabling a more efficient/effective translation capability
- Text/imagery analytics related to a threat model in a graph database produced Indications & Warnings (I&W) earlier than traditional I&W
- Social Media Analysis demonstrations/training programs improved NATO staff ability to manage the new information environment for strategic communication. The NATO Digital Working Group is an outgrowth of these experiential and learning opportunities.
- Tools to detect emergence of village level hot-spots shared with 91st Civil Affairs Bn prior to their deployment to Africa. A new database to identify natural resources seized by rebels to finance activities shared with USASOC to assess risk in Africa. New visualization tools to track how shocks to the global commodity markets lead to instability shared with US DOS and SOCOM.

COI Contact Information

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Protection, Sustainment and Warfighter Performance (PSWP)

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System Interfaces and Cognitive Processing (SICP)

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