



# **Department of Defense Human Factors Engineering Technical Advisory Group (DOD HFE TAG)**



# **Virtual TAG 2021**

**Unclassified - Navy Hosted**

## ***Human Factors of Data Driven Decision Making***

**29 & 30 June - Held via DCS**

**1130-1700 ET - 0830-1400 PT**

***DCS Lobby opens daily 1100 ET / 0800 PT***

# DoD HFE TAG

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## Origin

The Assistant Secretaries of the Services signed a Memorandum of Understanding in 1976 for coordinating and communicating working level Human Factors Engineering (HFE) research and development among the services and other Government agencies. As a result, the first Department of Defense Human Factors Engineering Technical Group (DoD HFE TAG) convened on August 9–10, 1977 in Fort Washington, Pennsylvania.

## Goals

The DoD HFE TAG (TAG) provides a no-cost registration mechanism for the timely exchange of technical information in the development and application of HFE by enhancing the coordination among Government agencies involved in HFE and Human Systems Integration (HSI) technology research, development, and application. The TAG also assists in the preparation and coordination of documents and sponsors in-depth technical interaction, which aids in identifying HFE technical issues, technology gaps and cross service solutions.

## Proponent

Dr. James “Ben” Petro, Director, Human Systems Directorate, Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) works closely with TAG Leadership to plan and sustain the TAG.

## Scope

The scope of the technical areas addressed by the TAG is broad due to the diversity of the subject matter covered by the HFE discipline. TAG defines HFE as the concepts, data, methodologies and procedures relevant to the development, operation, and maintenance of hardware and software systems. The subject matter subsumes all technologies aimed at understanding and defining the capabilities of human operators and maintainers.

## Composition

The TAG is composed of technical representatives from the DoD, National Aeronautics and Space Administration (NASA), Federal Aviation Administration (FAA), Department of Homeland Security (DHS), and the Veterans Health Administration (VHA) with research and development responsibility in human factors and related disciplines. Representatives from organizations with aligned interests and technical experts from allied countries may attend through TAG Member sponsorship. The TAG also includes designated representatives of technical societies or industry associations credentialed through the TAG Technical Society / Industry (TS/I) Group.

# VIRTUAL TAG

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The 2020 COVID-19 crisis necessitated agility and resilience of typical TAG constructs and processes. Once TAG leadership realized that we could not safely hold in-person sessions in 2020 and 2021, we conceptualized a Virtual TAG (VTAG). The main objective of VTAG is to sustain timely opportunities for cross service HFE/HSI practitioners to present current research, analyses, and perspectives with fellow practitioners, international peers and the military workforce in the absence of an in person session.

As a technical community consistently on the forefront of technology and innovation, we appreciate the importance of recency and relevancy when it comes to presenting and publishing HFE work. Therefore, with the endorsement and support of our OUSD(R&E) Proponent, TAG Leadership applied creative solutions to scale our typical weeklong in-person meeting with 19+ parallel technical tracks down to eight virtual, sequential technical areas spanning two half-days via DCS.

Current TAG members will notice that the structure of the VTAG agenda looks quite different from our typical program. VTAG planners suspended the typical SubTAG construct and processes in order to support another virtual arrangement. The 2021 VTAG Chairs reviewed submitted abstracts and sorted those that were accepted into eight technical areas:

Human Factors in Healthcare	Future Capabilities
Artificial Intelligence	Machine Learning
Measurement and Assessment	Personnel Selection
Serious Gaming and Extended Reality	Decision Making

In addition to our community of practice technical briefs, Ms. Barbara McQuiston, Performing the Duties of Under Secretary of Defense for Research and Engineering will provide the keynote address and FORCM David Twiford, Naval Information Forces Command Master Chief will present the Warrior Toughness Program within our “TAG the Deckplate” session.

Presentations cleared for public release and the VTAG 2021 Report will be posted to the DOD HFE TAG website. <https://rt.cto.mil/ddre-rt/dd-rtl/hfetag/>

# VTAG THEME

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## ***Human Factors of Data Driven Decision Making***

The focus of this virtual event is on applying an interdisciplinary, human centric approach to the exploration of challenges and solutions relating to human elements of data driven decision making as a major enabler of mission effectiveness and agility. DoD HFE TAG is providing this virtual forum as an opportunity for our members to sustain cross-service learning, leveraging, and information exchange across the HFE and Human Systems Integration (HSI) communities.

Technologies such as Artificial Intelligence and Machine Learning (AI/ML) can ingest and integrate real-time information and metrics at volume and speeds beyond human capacity to support Data Driven Decision Making (DDDM) and outcomes. Employing underlying algorithms, data repositories, and intuitive visualization they enhance human capacity for making strategic, agile decisions and help mitigate impacts of human factors such as subjectivity, emotion, and disposition from the decision making process.

In order to have an effective, sustainable DDDM program, consideration of topics such as data security, accessibility, trust, integrity, visualization, analytics, recency, as well as transactional and mass validity are paramount. The individual and compounding effects of these considerations in conjunction with human factors of performance can manifest as positive or negative impacts to decision making, significantly influencing outcomes. Understanding the outcome variance related to these human performance shaping factors and integrating their effects algorithmically with system performance models will strengthen readiness transparency and enable predictive, strategic planning for resilience.

Advances and achievements in this area are anticipated to have broad application and implication across DoD and beyond. However, the efficacy of the approach to enhance decision quality is heavily dependent upon the quality of the underlying elements. Therefore, it is imperative that the HFE government, industry, and academic communities of interest work together to ensure best practices are balanced with security and governance as these core capabilities are developed. VTAG 2021 will provide a collaboration environment for discussion of human centric challenges and potential solutions in order to forge the future of DDDM cross-service solutions.

# VTAG 2021 Schedule

*\*All times are in ET and agenda is subject to change*

## Tuesday, 29 June\*

### Commencement Events

1100 - 1130	Enter DCS Waiting Room	All Registrants
1130 - 1140	Welcome and Overview	Tom Alicia, Chair
1140 - 1150	VTAG Theme / Special Events	Marianne Paulsen, Vice Chair
1150 - 1200	Opening Remarks	Dr. Ben Petro, OUSD(R&E)
1200 - 1215	<u>Keynote Address</u>	
	Barbara McQuiston, Performing the Duties of Under Secretary of Defense for Research and Engineering (OUSD(R&E))	

### Technical Sessions

### Facilitator

1215 - 1315	Human Factors in Healthcare	Tandi Bagian, VHA
1315 - 1330	Break	
1330 - 1430	Artificial Intelligence	Daniel Wallace, NAVSEA
1430 - 1530	Measurement and Assessment	
1530 - 1540	Break	
1540 - 1640	Serious Gaming and Extended Reality	Tom Alicia, DEVCOM AvMC
1640 - 1700	Close Day One	

## Wednesday, 30 June\*

### Special Event

1100 - 1130	Enter DCS Waiting Room	All Registrants
1130 - 1140	Welcome and Overview	Tom Alicia, Chair
1140 - 1210	<u>TAG the Deck Plate</u>	
	Warrior Toughness Program: FORCM David Twiford, Naval Information Forces (NAVIFOR) Command Master Chief	

### Technical Sessions

### Facilitator

1210 - 1310	Future Capabilities	Marianne Paulsen, NAVIFOR
1310 - 1320	BREAK	
1320 - 1420	Personnel Selection	Darren Cole, USAF Operational Test and Evaluation Center
1420 - 1520	Machine Learning	
1520 - 1530	BREAK	
1530 - 1630	Decision Making	Tom Alicia, DEVCOM AvMC
1630 - 1700	VTAG Closing	

# VTAG Invited Speakers

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## Opening Remarks

**Dr. Ben Petro, SES**

**Director, Human Systems Directorate**

**Office of the Under Secretary of Defense for Research and Engineering**

As the Director of the Human Systems Directorate, Dr. Petro supervises and leads a team of senior experts to guide and oversee the Department's ~\$3B annual investment in human systems, medical, biological, and environmental research and regulatory compliance. He ensures portfolio alignment with National and DoD policies, strategies, and guidance and coordinates, integrates, and synchronizes Military Service and Component investments. He is the Senior Human Systems sciences advisor to the Office of the Under Secretary of Defense for Research and Engineering and the lead DoD representative to the White House Office of Science and Technology Policy and Interagency on related topics.

Dr. Petro obtained a Ph.D. in Microbiology and Immunology from Vanderbilt University (2001), M.S.S.I. in Strategic Intelligence from the Defense Intelligence College (2004), and B.S. in Biotechnology from WPI (1997). In 2020, he completed the Senior Executive Fellow program at the Harvard Kennedy School. In addition to supporting the Office of the Secretary of Defense, Dr. Petro has supported the White House National Security Council, the Department of Homeland Security S&T Directorate, and the Defense Intelligence Agency.

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## Keynote Address

**Ms. Barbara McQuiston**

**Performing the Duties of (PTDO) the Under Secretary of Defense for Research and Engineering**

Prior to taking her current position, Ms. McQuiston spent nearly a decade in government service at the Defense Advanced Research Projects Agency (DARPA). While at the agency, she served in the Defense Science Office, the Strategic Technology Office, and finally as a Special Assistant to the Director for Energy.

In addition to her time at DARPA, she has more than 30 years of commercial experience. Her work in the private sector has included various research roles, technology management, commercial development, and strategic planning. She has also worked on the development of innovative information, communications, biological, medical, and environmental technologies. Additionally, she has also advised capital management funds and negotiated and managed technology transfer agreements in both the public and private sector.





# **VTAG Invited Speakers**

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## **TAG the Deck Plate: The Warrior Toughness Program**

### **FORCM David Twiford**

#### **Naval Information Forces (NAVIFOR) Command Master Chief**

A native of Norfolk, Virginia Master Chief Twiford graduated from Manchester High School in Chesterfield, Virginia in June 1995. He enlisted in the United States Navy and reported to U.S Navy Recruit Training Command (RTC), Great Lakes, Illinois, following high school. Master Chief Twiford holds a Bachelor's degree in History from Excelsior College and is a graduate of the Navy's Senior Enlisted Academy (SEA 141 Khaki), National Defense University's Keystone course, and the Navy Post-Graduate School's Senior Leader Seminar.



Master Chief Twiford attended Cryptologic Technician Collection (CTR) "A" and "C" schools in Pensacola, Florida before reporting to USS Kearsarge (LHD-3) in Norfolk, Virginia in 1996. He reported to Pensacola, Florida for CTR "C" School in 1999 for more training. Upon graduation, he reported to Naval Security Group Activity (NSGA) Kunia, Hawaii, where he served as a direct support signals analyst and team LPO. While at Kunia, he deployed on six U.S. Pacific Fleet combatants, earning his Enlisted Dolphin pin and advancing to First Class. In 2002, he was selected as NSGA Kunia's Senior Sailor of the Year.

In March 2003, he transferred to RTC Great Lakes for duty as a recruit division commander (RDC). During his tour, he trained more than 700 recruits and was awarded the RDC Distinguished Leadership Award. In 2004, he was selected for Chief Petty Officer and served as a section Leading Chief Petty Officer (LCPO) at Battle Stations, where he oversaw approximately 15,000 Sailors complete their rite of passage into the Navy. In November 2006, he arrived aboard USS San Jacinto (CG-56) and was selected for Senior Chief in May of 2007 and served as the Operations LCPO. He transferred to the Command Senior/Master Chief community in April 2009 and reported aboard USS Constitution in Boston, Massachusetts as her Command Senior Chief. He was selected for Master Chief in April 2010. During his tenure on Constitution, the ship earned her first Meritorious Unit Commendation (MUC) in 16 years and the fourth in her 213-year history. Additionally, the ship earned the Golden Anchor and Blue H for the first time.

He later served as Command Master Chief of U.S. Naval Activities Spain/Naval Station Rota, Spain, USS Mesa Verde (LPD-19), USS Kearsarge (LHD-3), and Region Command Master Chief for Navy Region Southeast. He most recently served as the Command Master Chief for RTC Great Lakes.

Along with multiple unit and campaign awards, his personal awards include the Meritorious Service Medal (five awards), Navy Commendation Medal (four awards), and Navy Achievement Medal (four awards). He is qualified as an Enlisted Information Warfare Specialist, Enlisted Surface Warfare Specialist, Enlisted Aviation Warfare Specialist, Enlisted Dolphin and is a designated Master Training Specialist.

In November 2020, Master Chief Twiford assumed his duties as the Force Master Chief for Naval Information Forces, Suffolk, Virginia.

# 29 June VTAG Technical Sessions

## 1215 - 1315 Human Factors in Healthcare

- 1215 - 1235 **Designing for the Rapid Integration and Dissemination of New Information in a Healthcare System During the COVID-19 Pandemic**  
*Helen Fuller, Veteran's Health Administration (VHA)*
- 1235 - 1255 **Usability Evaluation of Environmental Control Units for Veterans with Spinal Cord Injuries and Disorders: Preliminary Results from Remote A/B Testing with a Neurotypical Population**  
*Gabriella Hancock, Ph.D., California State University, Long Beach*
- 1255 - 1315 **Scope of Back and Neck Injury / Pain in Manned Naval Air Platforms**  
*Cody Nicholson, Naval Post Graduate School*

## 1330 - 1430 Artificial Intelligence

- 1330 - 1350 **The Intersection between Artificial Intelligence and Human Subjects Research**  
*Kim London, JD, MPH, Air Force Research Laboratory*
- 1350 - 1410 **A Naturalistic Investigation of AI, Trust, and Intelligence Analysis: Early Results**  
*Steve Dorton, Sonalysts, Inc.*
- 1410 - 1430 **Traffic Aware Strategic Aircrew Requests: An Overview**  
*Matthew Underwood, NASA Langley Research Center*

## 1430 - 1530 Measurement and Assessment

- 1430 - 1450 **Determining the Utility of Serious Games for Cyber Aptitude Assessment**  
*Jaclyn Martin-Kowal, Personnel Decisions Research Institute*  
*Brenton M. Wiernik, Department of Psychology, University of South Florida*
- 1450 - 1510 **Investigating Aptitude Requirements for Airmen Working with Automation**  
*Michael Brady, Infoscitex*
- 1510 - 1530 **Data for Human Consumption vs. Data for Machine/Computer Consumption**  
*Matt Shivers, US Army Combat Capabilities Development Command Aviation & Missile Center*

## 1540 - 1640 Serious Gaming and Extended Reality

- 1540 - 1600 **Video Gaming in the USN and USMC: Its Extent and Impact**  
*Nita Lewis Shattuck, Naval Postgraduate School*
- 1600 - 1620 **Enhancing AR with Quantitative VR Human Performance Data**  
*Aaron Gardony, Ph.D., US Army Combat Capabilities Development Command Soldier Center*
- 1620 - 1640 **Testing Method for a Gross-Motor Haptic Feedback Device in Virtual Reality: Evaluating Operability, User Experience, and Psychophysical Immersion**  
*Kirsten Miskovich, Naval Undersea Warfare Center, Keyport*



# 30 June VTAG Technical Sessions

## 1210 - 1310 Future Capabilities

- 1210 - 1230 **Most Sensor Command and Control Interfaces are Awful**  
*Laura A. McNamara, Sandia National Laboratories*
- 1230 - 1250 **Findings from Future Vertical Lift Cognitive Workload Risk Mitigation Study**  
*Katie Ernst, Applied Decision Science, LLC*
- 1250 - 1310 **Workforce Implications of Robotic and Autonomous Systems**  
*Michael Boardman, United Kingdom Defence Science Technology Laboratory*

## 1320 - 1420 Personnel Selection

- 1320 - 1340 **[Adverse] Impact of the ASVAB (AFQT) and Differential Prediction on Military Training Outcomes**  
*Gregory Manley, Ph.D., Office of People Analytics - Defense Personnel Assessment Center*
- 1340 - 1400 **Expanding the Measurement of AFOQT**  
*Tracy Kantrowitz, Personnel Decisions Research Institutes*
- 1400 - 1420 **Towards Technology-Enabled Assessments in USAF Personnel Selection and Classification**  
*Julia Walsh, DCS Corp/IST*

## 1420 - 1520 Machine Learning

- 1420 - 1440 **Interactive Machine Learning for Geographic Information Systems**  
*Jaelle Scheuerman, Center for Geospatial Sciences, U.S. Naval Research Laboratory*
- 1440 - 1500 **Performance in Noise, Speech to Text Communications Aid**  
*Tyler Ferro, Naval Surface Warfare Center, Dahlgren*
- 1500 - 1520 **The Importance of Interpretability in Machine Learning Algorithms for Disaster Relief**  
*Thomas Schen, Academy for Mathematics, Science, and Engineering*

## 1530 - Decision Making

- 1530 - 1550 **Developing Operator State Monitoring Analytical Pipelines for Driving Aviation Decision Making**  
*Kevin O'Brien, U.S. Army Aeromedical Research Laboratory*
- 1550 - 1610 **Criterion Variability in Binary Decision-Making During Submarine Periscope Observations**  
*Jason Ralph, Naval Undersea Warfare Center, Newport*
- 1610 - 1630 **Enhancing Data Driven Decision Making through Optimized Human Performance Data**  
*Seth Elkin-Frankston, Ph.D., US Army Combat Capabilities Development Command Soldier Center*

# **VTAG LEADERSHIP**

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## **Proponent**

Dr. Ben Petro, Director, Human Systems Directorate, Office of the Undersecretary of Defense for Research & Engineering OUSD(R&E)

## **Chair**

Dr. Tom Alicia, Engineering Research Psychologist, US Army Combat Capabilities Development Command Aviation & Missile Center

## **Vice Chair**

Ms. Marianne Paulsen, Senior Engineering Psychologist, Naval Information Forces Command, N7 Training and Education

## **Outgoing Chair**

Mr. John Plaga, Life Support Technical Expert, Air Force Life Cycle Management Center

## **OUSD(R&E) Proponent Liaison**

Dr. Liana Algarín, Human Factors Senior Analyst, Strategic Analysis, Inc.

**Thank you for attending VTAG 2021!**

# **DoD HFE TAG #74**

**IN PERSON**

**Spring 2022**

**Host: TBD**

**Location: TBD**

***Check the TAG Website and Social Media for updates***

<https://rt.cto.mil/ddre-rt/dd-rtl/hfetag/>



<https://mobile.twitter.com/dodhfetag?lang=en>



<https://www.facebook.com/DoDHFEtag/>



<https://www.linkedin.com/groups/6786183>