



RELIANCE 21 – DoD COMMUNITIES OF INTEREST Human Systems



Scope/Thrust Areas

Personalized Assessment, Education and Training “Right Person, Right Job, Right Skills”

- Personnel Selection and Assignment
- Training Design, Assessment, and Readiness Monitoring
- Advanced Learning Technologies



System Interfaces and Cognitive Processes “Effective, Natural Human-Machine Teaming”

- Understanding Human/Cognitive Processing
- Human-Machine Interaction and Aiding
- System Level Interfaces and Teaming



Protection, Sustainment, and Warfighter Performance “Ensuring Warfighter Safety and Survivability”

- Sensing, Monitoring, and Assessment
- Enhancement Technologies and Techniques



ENABLE

SUSTAIN

ENHANCE

VISION: Develop and deliver technologies to enable, sustain, enhance and quantify human performance for measurably improved mission effectiveness

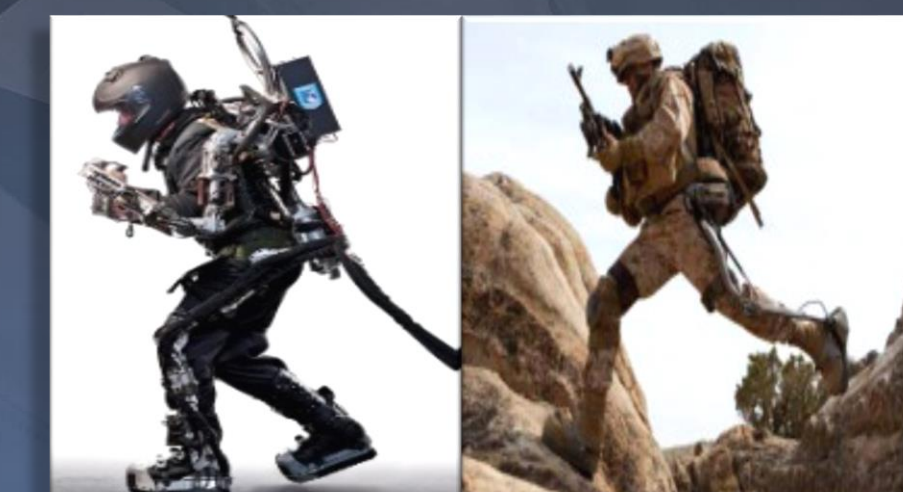
Impact on Capability Needs/Success Stories

Techniques for Soldier-Exoskeleton Analysis

- Research line transition to Combat Capabilities Development Command Soldier Center

Technologies/Benefits:

- Recommendations for assessment tasks and measurement approaches to inform Exoskeleton technology demos
- Establish framework for human movement database and availability of initial data to guide Exoskeleton system development



Joint Terminal Area Controller Virtual Trainer

- Compact, highly transportable and easy-to-use Virtual Reality (VR) training environment.

Technologies/Benefits:

- Uses low-cost, high-quality commercial VR platforms to create a portable “JTAC-in-a-box” training capability – used at RIMPAC exercise
- Employs relevant tools: laser range finder, wrist-worn GPS; night vision goggles; laser pointer; helmet mounted flashlight; virtual chest-worn tablet for aircraft video downlinks
- Instructor controlled training of AC-130, A-10 Thunderbolt, AH-64, UH-60 and MEDEVAC 9 lines



Advanced Small Unit Decision Making

- Adapting and tailoring simulation based training and rapidly providing relevant terrains for planning/review

Technologies/Benefits:

- Developed Learning Management System for assessing performance
- Developed Digital Integrated Representation of Tactical Environment
- Conducted five builds for end-user, transition customer feedback



Closed-Loop Oxygen Generation and Delivery

- Maximize safe oxygen delivery and minimized oxygen/power consumption

Technologies/Benefits:

- Successful mitigation of hypo/hyperoxemic events in pre-clinical/clinical models,
- Novel mechanical ventilation/oxygen concentrator interoperable system
- Received FDA Investigational Device Exemption to conduct a first-of-its-kind clinical trial utilizing closed loop control of oxygen delivery during mechanical ventilation in trauma patients



Focus Going Forward

Personalized Assessment, Education and Training

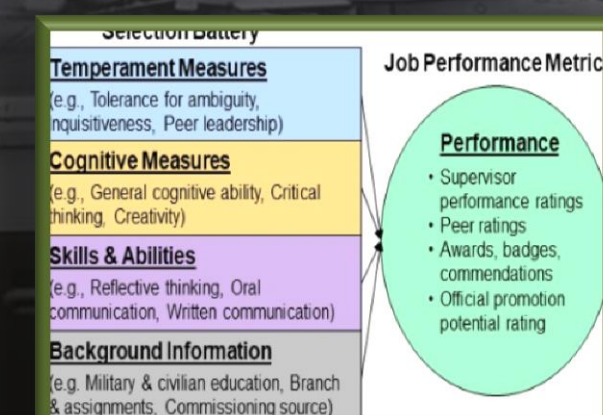
- Provide “Train as We Fight” Opportunities with Live Virtual Constructive Environments for Current/Future Systems
- Develop Individualized, Proficiency-Based Assessments of Training Effectiveness and Operational Performance
- Talent Assessment and Management Personalized Through Big Data

System Interfaces and Cognitive Processes

- Real-time Measurement, Assessment and Prediction of Warfighter Performance and functional State
- Enhance Warfighter Effectiveness by Coupling Humans and Intelligent Machines to Maximize Performance in “Fog of War”
- Adaptive Human-Machine Interface for Optimized Weapon System and Warfighter Performance in Contested Environments

Protection, Sustainment, and Warfighter Performance

- Provide Real-world, Real Time Performance Assessment to Inform Warfighter Readiness
- Optimize Warfighter Performance: Nutrition, Individual Needs, and Harsh Environments



Engagement Opportunities for Industry

- Defense Innovation Marketplace: Online resource for insight into DoD investment priorities and capability needs
- FedBizOps.gov, Broad Agency Announcements and Industry Days for solicitations
- National Defense Industrial Association (NDIA) Human Systems Conference: Interact with key DoD leaders, discuss latest COI roadmaps, and present industry efforts. 2020 Theme “ Multi-Domain Operations”
- DoD Human Factors Engineering Technical Advisory Group Meeting (HFE TAG): Annual technical exchange on HFE applications, issues and technology gaps. 2020 theme: “Are We Resilient Enough?”
- Human Systems COI Independent Research & Development (IR&D) TIM: Discussions on how IR&D efforts can meet warfighter needs
- Inter-service/Industry Training, Simulation, & Education Conference (I/TSEC): Training, sims & training systems