



## Human Sciences Campaign Overview

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U.S. ARMY  
**RDECOM**

# Human Sciences

**ARL**



A Soldier traversing the SPEAR networked cross country course at Aberdeen Proving Ground

## *Third Offset Strategy*

- *Autonomous “deep learning” machines and systems*
- *Human-machine collaboration*
- *Assisted-human operations*
- *Advanced human-machine teaming*
- *Semi-autonomous weapons*

*- Deputy Secretary of Defense Work*

Understand and predict dynamic  
**HUMAN BEHAVIOR**  
of individuals, teams, organizations, and societies in real world situations

Directly and indirectly **enhance** individual  
**HUMAN CAPABILITIES**  
applicable to broad ranging scenarios

Discover, understand, exploit, and apply  
fundamental principles for the  
**INTEGRATION of HUMANS and SYSTEMS**

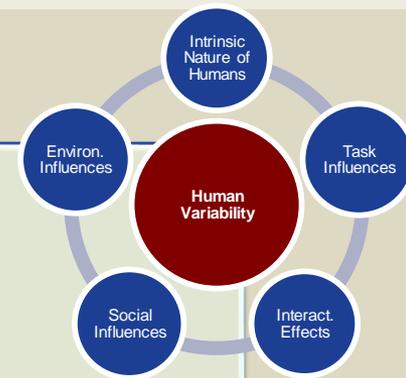
across domains, including but not limited to complex information systems, human-agent teams, cybersecurity, and organizational and social networks

*Win in a Complex World*



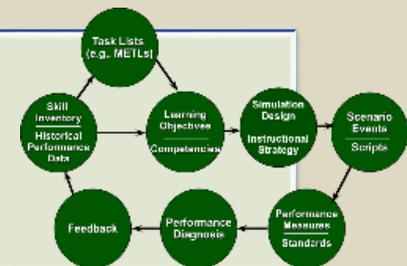
## Human Behavior

- Human Variability
- Real World Behavior



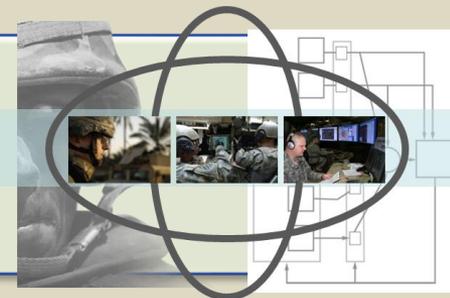
## Enhancing Human Capabilities

- Augmentation
- Training



## Integration of Humans and Systems

- Integration Technologies
- Humans in Multi-Agent Systems





## Vision

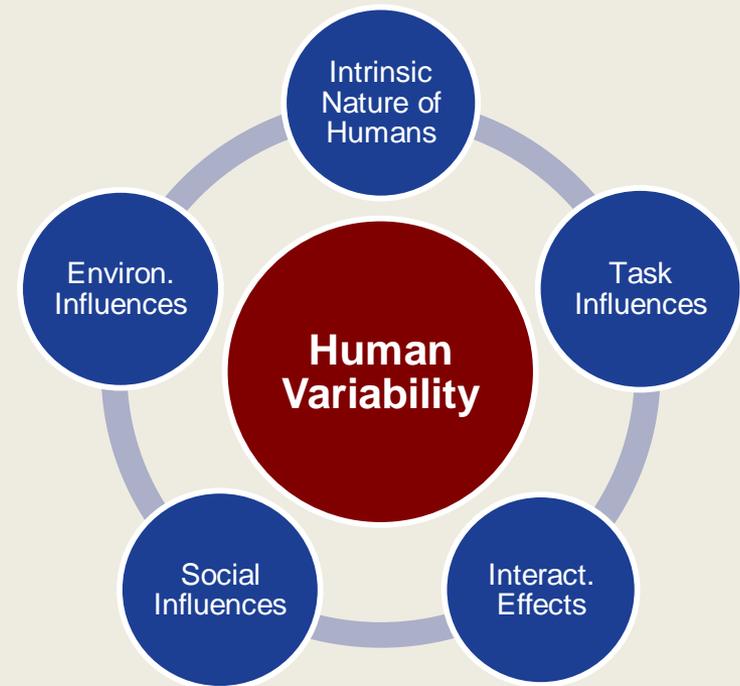
*Predict warfighter performance and provide enablers to enhance Soldier capabilities by maximizing Soldier-system performance well beyond the capabilities of today's Army*

## Technical Challenges

- *Continuously interpret and predict Soldier state in real-world environments*
- *Integrate technology assessment states, adaptation, and intent*
- *Unobtrusive assessment*
- *Team performance in training and operational environments*

## Technical Areas

- *Human Variability*
- *Real World Behavior*

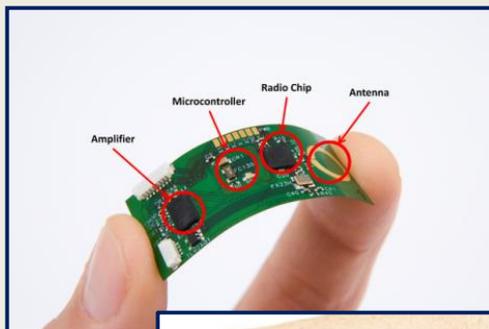
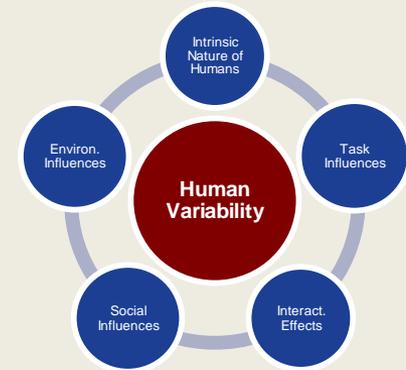




## Key Campaign Initiative:

### *Continuous Multi-Faceted Soldier Characterization for Adaptive Technologies*

Provide the foundation for Army systems to adapt to the individual Soldier's states, behaviors, and intentions in real-time





## Vision

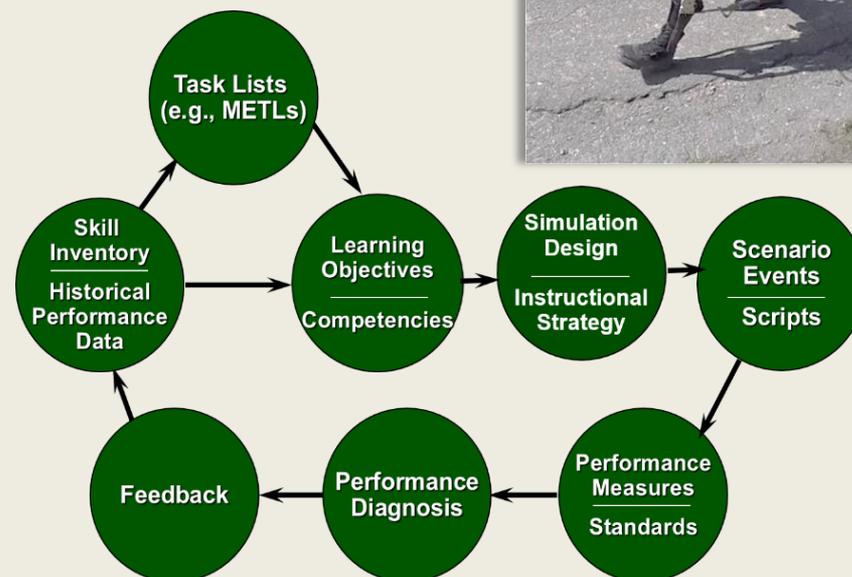
*Unprecedented capabilities for future warfighters and enable future leaders to make sound decisions effectively in complex socio-cultural contexts*

## Technical Challenges

- *Enhance human perceptual, cognitive, physical, and social capabilities*
- *Individuals and teams within organizations and societies*
- *Support periods of limited capabilities*
- *Deliver at the point of need to enhance and learn, perform, adapt, and sustain*

## Technical Areas

- *Augmentation*
- *Training*





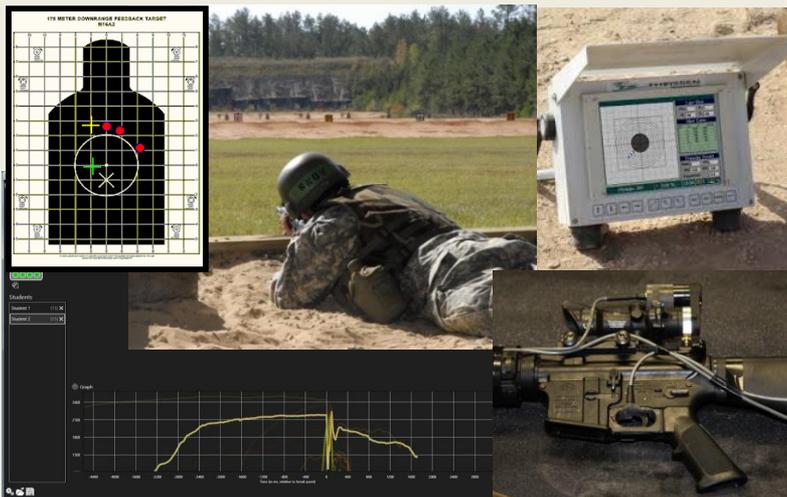
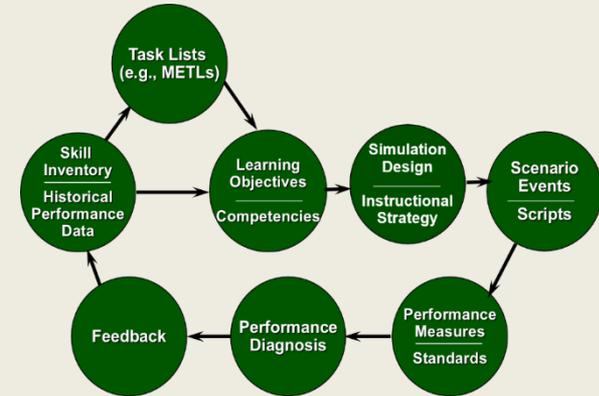
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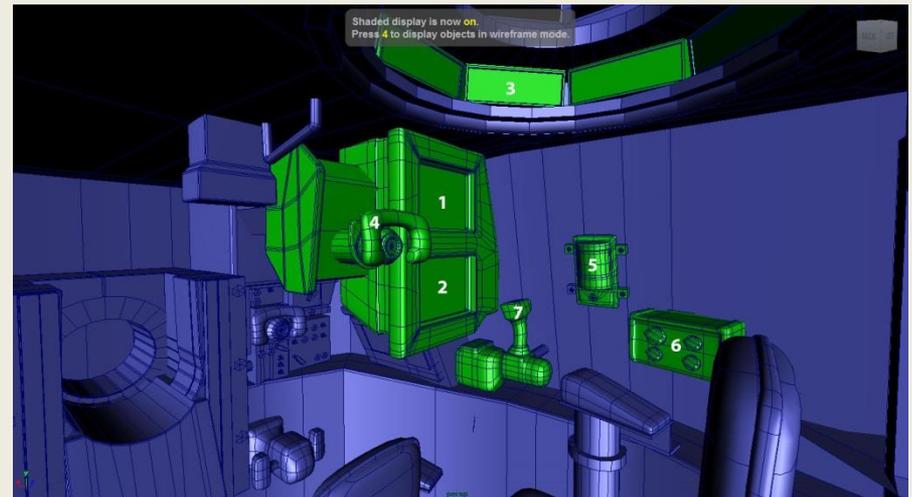
## Key Campaign Initiative:

### *Training Effectiveness Research*

Reduce the time required for Soldiers to attain domain competency, increase the rate of knowledge and skill retention, and increase the rate of training transfer for mission readiness



Automated Assessments in Marksmanship,  
a Training Effectiveness Use Case



VR Testbed being extended for a Training Effectiveness Study



## Vision

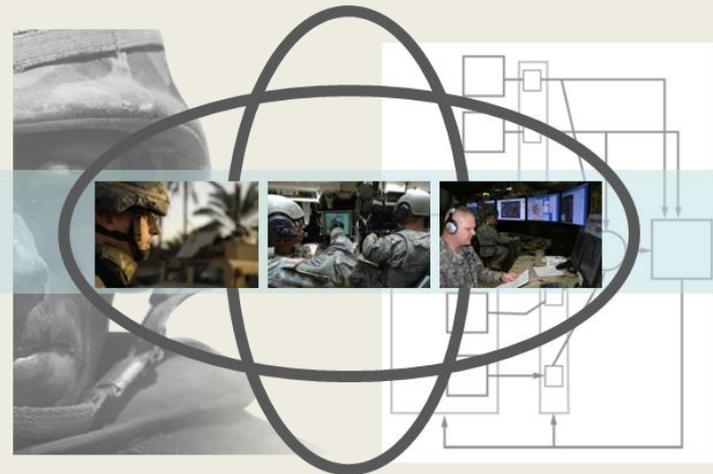
*Determine approaches for stable, agile, adaptive control based on individual human capabilities and states, and human influences on overall system design and effectiveness*

## Technical Challenges

- *Cybernetic models of dynamic human, multisensory closed-loop behavior*
- *Quantify complex dimensions underlying perception of real-world multisensory events*
- *Enhance adaptive human-system interactions*
- *Mixed-agent teaming*
- *Enhance decision making, team performance, situation awareness, and effective interaction in all operational environments*

## Technical Areas

- *Integration Technologies*
- *Humans in Multi-Agent Systems*

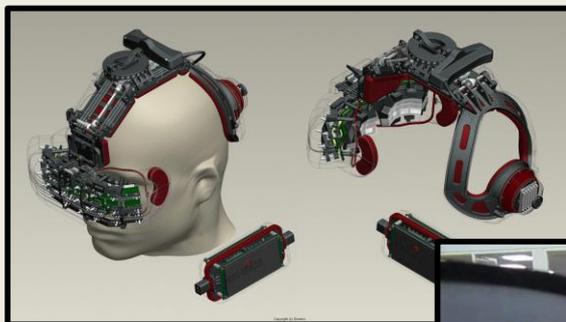
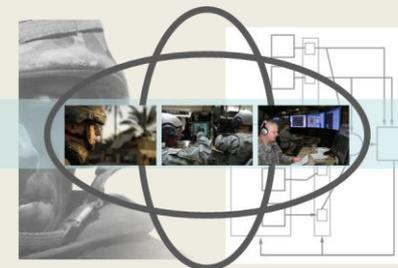




## Key Campaign Initiative:

### *Human System Integration (HSI) (Cybernetics)*

Develop new methods, models, approaches, and capabilities for enhancing HSI in the design cycle through advances in cognitive, social, and physical performance





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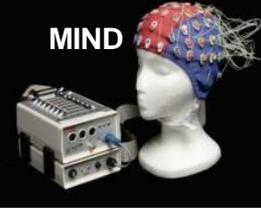
# Human Sciences Laboratories



- Mission Impact through Neuro-inspired Design (MIND) Laboratory
- Cognitive Assessment, Simulation, & Engineering Laboratory (CASEL)
- Soldier Performance and Equipment Advanced Research (SPEAR)
- Cyber-Human Integrated Modeling & Experimentation Range Army (CHIMERA)



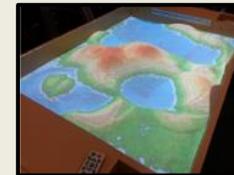
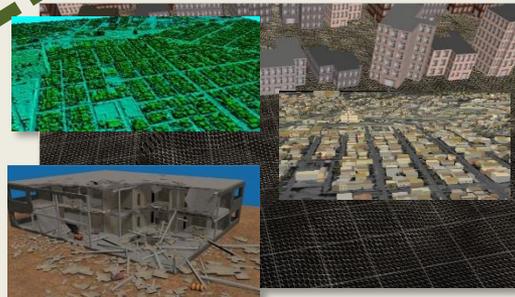
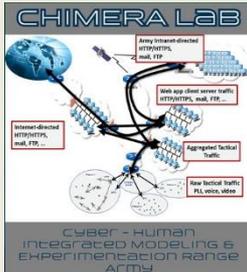
MIND



CASEL



SPEAR



**APG, MD**  
**Orlando, FL**

- Adaptive Tutoring Lab
- Virtual/Augmented Reality Lab
- Gaming Lab
- Medical Research/Tissue Lab



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