



Cognitive Readiness Special Interest Group

DoD HFETAG

Katrina A. May, Chair

May 4, 2010



Agenda

- Welcome
 - Sign-in Sheets
- Cognitive Readiness
 - Katrina A. May, ARL-HRED
- SBIR 101
 - CAPT Dylan Schmorrow, PhD.
- Discussion Time



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Formation of the CogR Special Interest Group

- Last year the Cognitive Readiness Special Interest Group was formed per a request from the DoD HFETAG's proponent, Dr. Bob Foster (retired), as a way to help resurrect Cognitive Readiness as a major thrust in the DoD.
- We met for the first time in November of 2009 in Key West, FL where we discussed the potential for new SBIR themes that feature Cognitive Readiness.



Cognitive Readiness Defined

- *Cognitive readiness* is the mental preparation (including skills, knowledge, abilities, motivations, and personal dispositions) an individual needs to establish and sustain competent performance in the complex and unpredictable environment of modern military operations (J.E. Morrison, J.D. Fletcher).
- *Cognitive readiness* differs from *effectiveness* in that it isn't a measurement of *performance* but a measurement of *potential*.



Early Cognitive Readiness Research

- In the late 90s-early 2000s the Deputy Under Secretary of Defense (Science and Technology) (DUSD(S&T)) began getting interested in the concept of Cognitive Readiness (CogR)
- This interest eventually led to the DoD Small Business Innovation Research (SBIR) Program funded research
- Some of the key players through the years have been:
 - The Army Research Institute (ARI)
 - The Army Research Lab – Human Research & Engineering Directorate (ARL-HRED)
 - The Air Force Research Lab (AFRL)
 - NAVAIR-Orlando



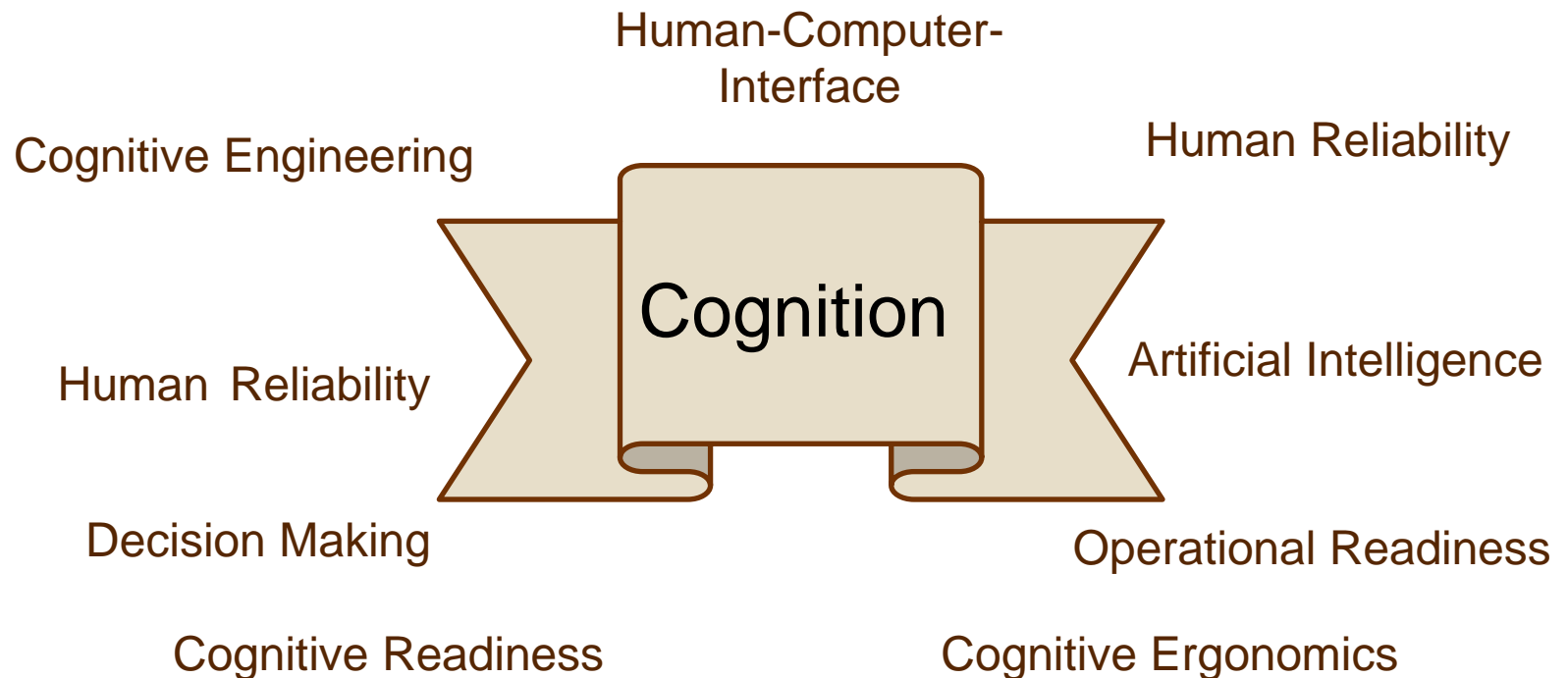
Cognitive Readiness as a Framework

- CogR is an S&T advocacy framework for:
 - Ensuring that warfighters are mentally prepared for accomplishing the mission
 - Ensuring that warfighters are performing at their optimal performance level
 - Ensuring the tools and techniques for preparing warfighters are the most effective and affordable
 - Ensuring the tools and techniques that warfighters use are the most effective and affordable
 - A criterion for Warfighting success
 - Fully prepared joint-warfighters, fighting and winning in an information rich, distributed firepower battlespace using human-centered hardware and systems
- Cognitive Readiness is not:
 - Preparing warfighters physically for accomplishing the mission
 - Preparing and sustaining warfighters through the practice of medicine



Current Trends & Related Concepts

- In recent years the focus of research efforts seemed to have moved away from CogR as an S&T framework and focused efforts more on the various elements and domains within CogR as well as Cognition as a whole.





CogR Research Domains

Cognitive

- Cognition and mental acuity
- Decision Making
- Neuroergonomics & Neuroscience

Human Systems Integration

- Human-centered design
- Human Reliability
- Augmented Cognition
- Network Science

Education & Training

- Psychology of Learning
- Teaching/learning specific tasks, skills, or procedures

Health & Welfare

- Physiological, Quality of life, & Morale

Socio-Cultural

- Family, group and culturally defined issues
- Leadership, Selection, classification





2010 SBIR/STTR Themes

Recently two SBIR themes were released:

- **The Cognitive Edge: Enabling Cognitive Readiness in Dynamic Warfighting Environments**
 - This theme supports research topics that will utilize the knowledge products from disciplines such as cognitive science, network science, augmented cognition, neuroergonomics, learning science, psychology, and sociology to pioneer new developments to enable the cognitive readiness of warfighters.
- **Decision Support Technologies for Understanding Socio-Cultural-Behavioral Data**
 - This theme supports research topics that go beyond simple model development to utilize innovative technologies to develop and validate decision support tools that integrate with socio-cultural and behavioral data, models, and modeling output. Operational decision makers, analysts, planners and war gamers require innovative decision support tools that will allow them to have available forecasting tools for socio-cultural and behavioral (human terrain) responses at the strategic, operational and tactical levels.



SBIR Topics Submitted

- The Cognitive Edge: Enabling Cognitive Readiness in Dynamic Warfighting Environments

Team Mental Models

Decision Support Cog Readiness
Assessment and Reporting

Neuro Cognitive Control of Human
Machine Systems

Rapid Assessment of Team Cognitive
Readiness

Real Time Cognitive Readiness

Embeddable Agents for Cog Readiness

Immersive Sim for Intuitive DM

The Next Generation of the ACRA

Training for Cognitively Ready Teams

Distributed Team Workload



SBIR Topics Submitted

- Decision Support Technologies for Understanding Socio-Cultural-Behavioral Data

Decision Superiority through Enhanced Cultural Intelligence Forecasting

Neuromorphic Models of Human Social Cultural Behavior

Visualization Methods and Tools for Human, Social, Cultural, and Behavioral Models

Automated Network Construction

Developing and Modeling Social Networks inside Technology Poor Societies

In Situ Collection of Human Social Cultural Behavioral Data

Analytical Tools for Local Economic Analysis

An Adaptive Cultural Trainer for Development of Cultural Aptitude in Warfighters

Dynamic Meta-Network Analysis



Combined Efforts

- Even though these two themes are different, they both possess permeable boundaries and contain overlying concepts.
- Through coordination and information sharing we hope to set the framework for future collaborations.



Common Threads

- Team Emphasis
- Decision Support
- Rapid and Real-Time Assessments
- Immersive and Embeddable Training
- Human, Social, Cultural and Behavioral Modeling
- Training
- Cognition
- Cultural and Social influences
- Social Networking and Network Science concepts
- Neuroscience concepts



Future Plans

- Use the CogR Special Interest Group as the primary vehicle for topic authors to discuss, link and manage their SBIR programs.
- Have topic authors brief on the progress of their programs at the November TAG.



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Enabling Technologies & System Applications

- Personnel Research
 - Better person-to-job fit
- Socio-Cultural Research
 - Capitalize on Diversity
- HFE & HSI Elements
 - Better Human-Computer-Interface
 - Better Human-Equipment Interface
- Network Sciences
 - Enhancing Distributed Work Environments
- Embedded Training
- Modeling and Simulation
- Cognitive Task Analysis



BACK UP SLIDES



Cognitive Readiness Concept

