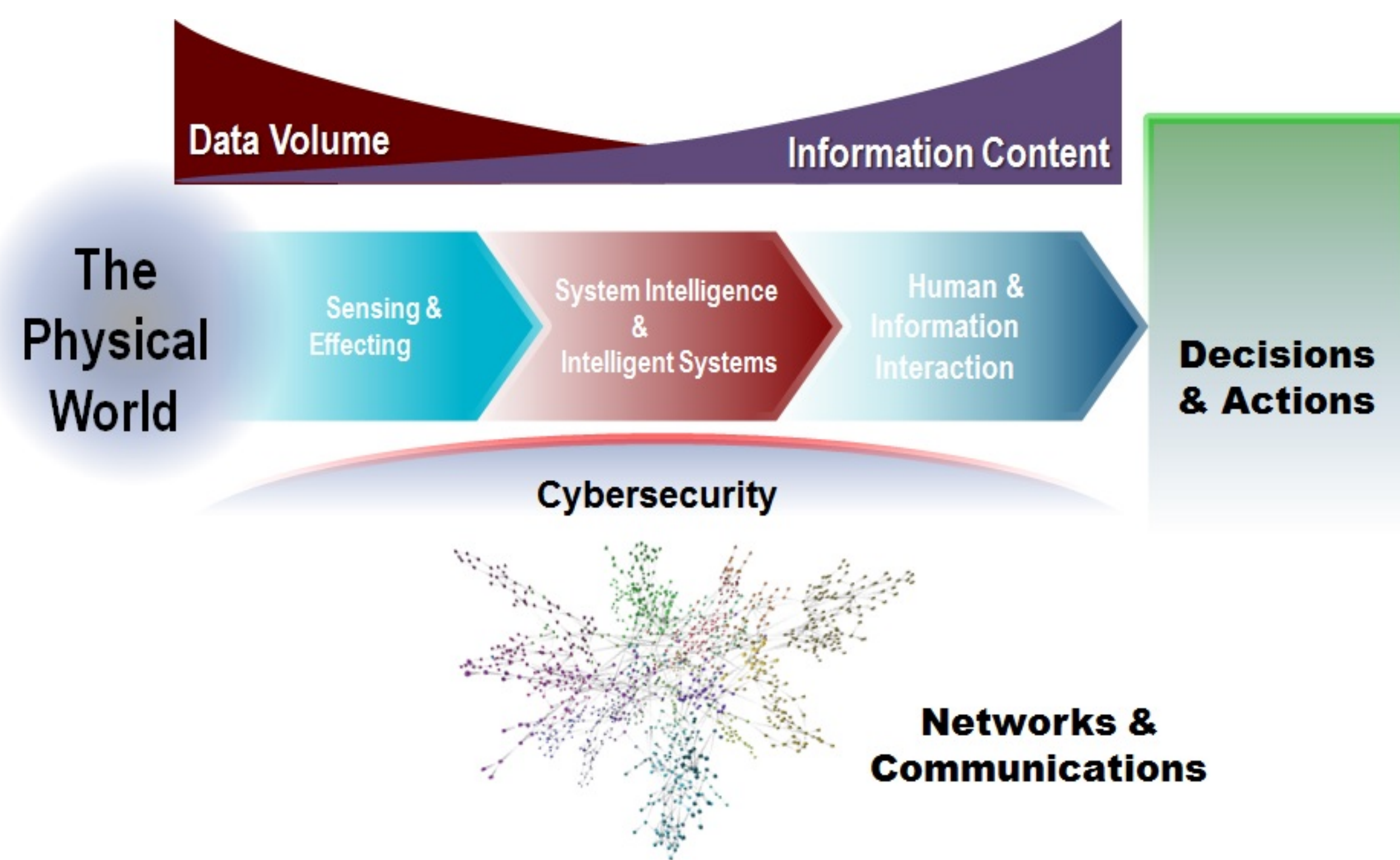


S&T Campaign: Information Sciences
Sensing and Effecting

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Research Objective

- Perform basic and applied research with a holistic view to sensor, data, information processing and fusion for linking the physical sensors and data/information sources to users at the tactical edge.
- Focus research on relevant aspects such as distributed, disparate & multi-modal, dynamic, end-to-end information flow in constrained environment



Data & Information Collection Process for Situational Understanding

ARL Facilities & Capabilities Available to Support Collaborative Research

- *Sensor Information Testbed for COllaborative Research Enterprise (SITCORE)*
- Automated Online Data Repository (AODR)
- Access *Open Standards for Unattended Sensors (OSUS)* – networked sensing sensor integration laboratory (SIL)
- *Network Science Research Laboratory (NSRL)*
- Access to *NS CTA & ITA Experimentation Facility* and Open Campus guest researchers

Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration

- Access multi-modal signature database and baseline signal processing & fusion for advanced algorithm development
- Access to fielded ISR sensor assets for testing and implementing algorithms
- Access to military SME's to develop relevant use cases and operational context for research
- Participation in networked sensing and fusion related field experiments and technology demonstrations
- Subject Matter Experts for unattended sensor integration and interoperability

Challenges

- Highly dynamic, complex, coalition, constrained and contested tactical environment
- Situation understanding involving multiple interacting actors in many dimensions (military, coalition, economic, social, political, etc.)
- Rapid growth in the volume and complexity (variety, velocity and veracity) of data and information
- Downward trend in number of military personnel

This complex block contains several panels:

- Model Complex Adaptive Systems**: Includes images of military operations and text: "Derive User Context and Information Goals".
- Enable Situational Understanding in Complex Operations**: Includes images of soldiers in a field.
- Low-level & High-level Integrated Fusion**: A central panel showing data types: Images (multi-spectral), Video, Audio, Text, and Sensors. It features a network graph with nodes and edges, and labels like "BIG DATA", "female", and "mortar". Below it is "Distributed Analytics & Visualization".
- Contextualize Disparate Coalition Data Sources**: Includes images of various data sources like social media (Facebook, Twitter) and news ("THE WORLD NEWS TERRORIST ATTACK").
- Optimize Distributed Data Sources & Services relevant to Mission Tasks**: Text at the bottom of the data sources panel.

Fundamental research underpinnings for enabling distributed analytics and deriving situational understanding for distributed forces operating at the tactical edge