

# Defense Advanced Research Projects Agency

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## Breakthrough Technologies for National Security

Steven Walker, Ph.D.

Deputy Director







# Breakthrough Technologies for National Security

## DARPA's Portfolio Today

Diminishing returns for monolithic systems



Information is exploding



First-mover advantage



### **Rethink complex military systems**

- Electromagnetic spectrum dominance
- Position, navigation & timing beyond GPS
- Air superiority in contested environments
- Maritime system of systems
- Robust space
- Overmatch on the ground
- Defense against mass terrorism

### **Harness information**

- Scalable cyber capabilities
- Electronics with built-in trust
- Big data tools
- Next-generation AI

### **Create technological surprise**

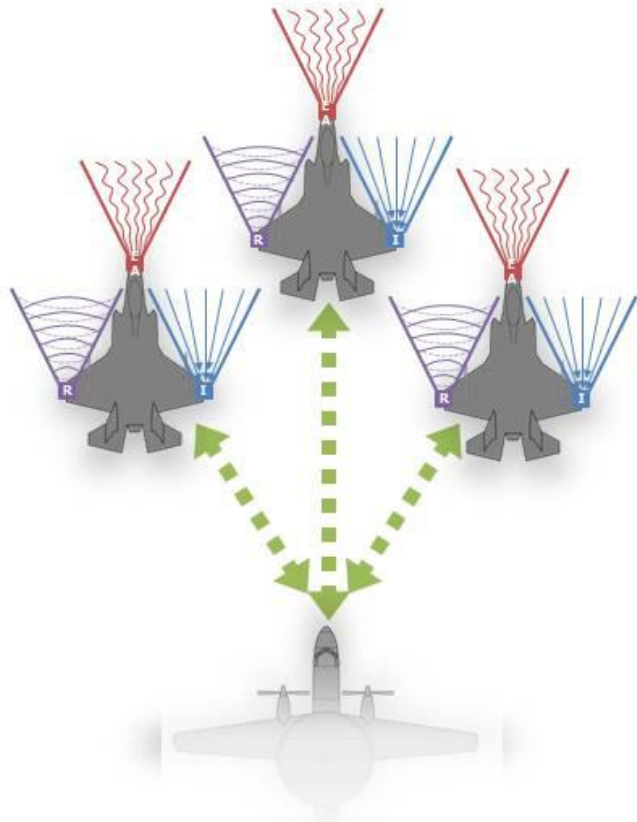
- Outpacing infectious disease
- Neurotechnologies
- Synthetic biology
- Chemistry, physics, math, materials
- Understanding complexity
- Human-machine symbiosis

*These focus areas are part of a broad and diverse portfolio of DARPA investments  
Focus areas change over time as some succeed and others fail and as DARPA identifies new challenges and opportunities*

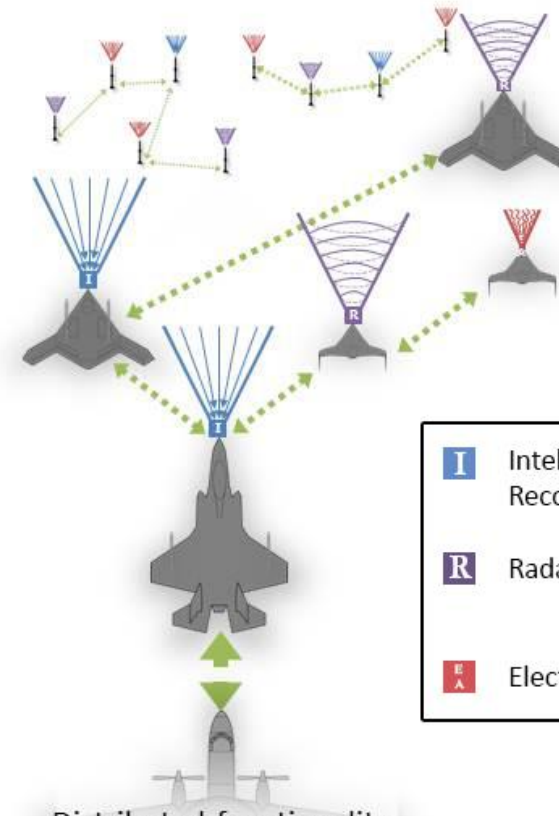


# Air Superiority in Contested Environments

## System of Systems (SoS) Integration Technology and Experimentation (SoSITE)



Platform centric  
Vulnerable to countermeasures  
Limited number of costly platforms  
Multi-decade development cycles



Distributed functionality  
Robust to countermeasures  
Numerous low-cost platforms  
Rapid development cycles

- I** Intelligence, Surveillance and Reconnaissance (ISR)
- R** Radar
- E A** Electronic Attack



# Robust Space

Responsive space access and real-time space situational awareness





# Unmanned Maritime Vessels

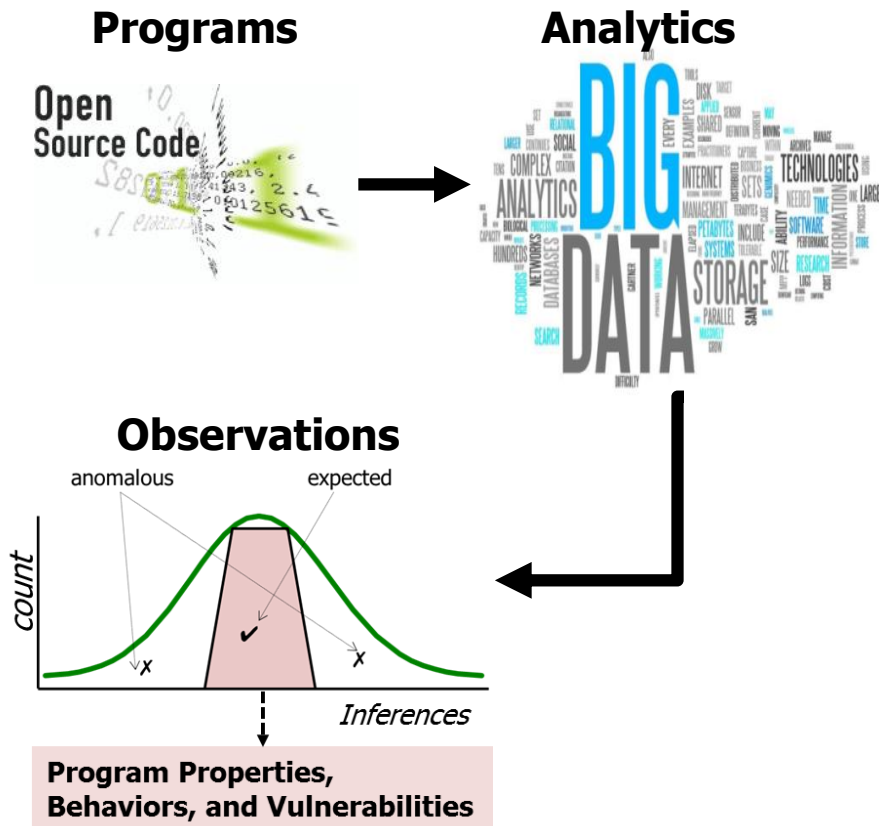
Anti-Submarine Warfare (ASW) Continuous Trail Unmanned Vessel (ACTUV) moved to water on 27 Jan 2016



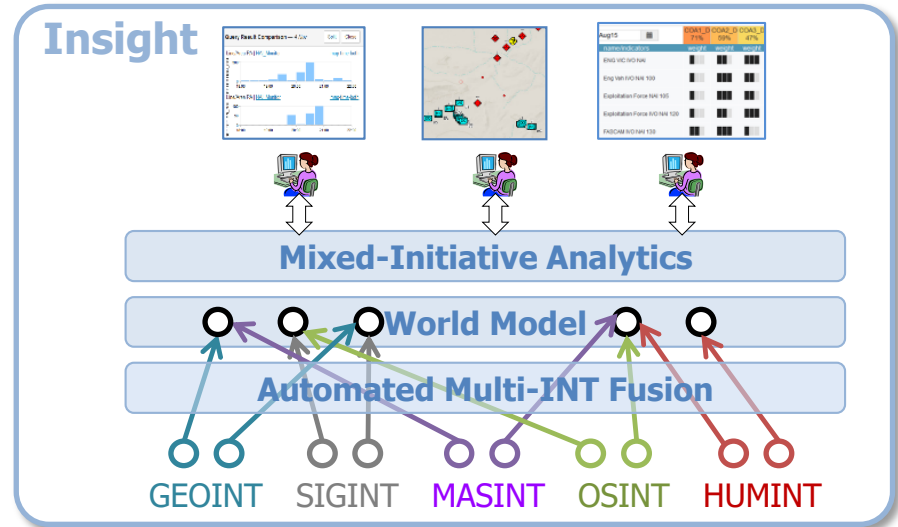


# Machine Learning and Data Analytics

Machine learning to aid the human



Uncover hidden patterns





# Scalable Cyber Capabilities

High assurance methods to minimize cyber vulnerabilities and defend against attacks

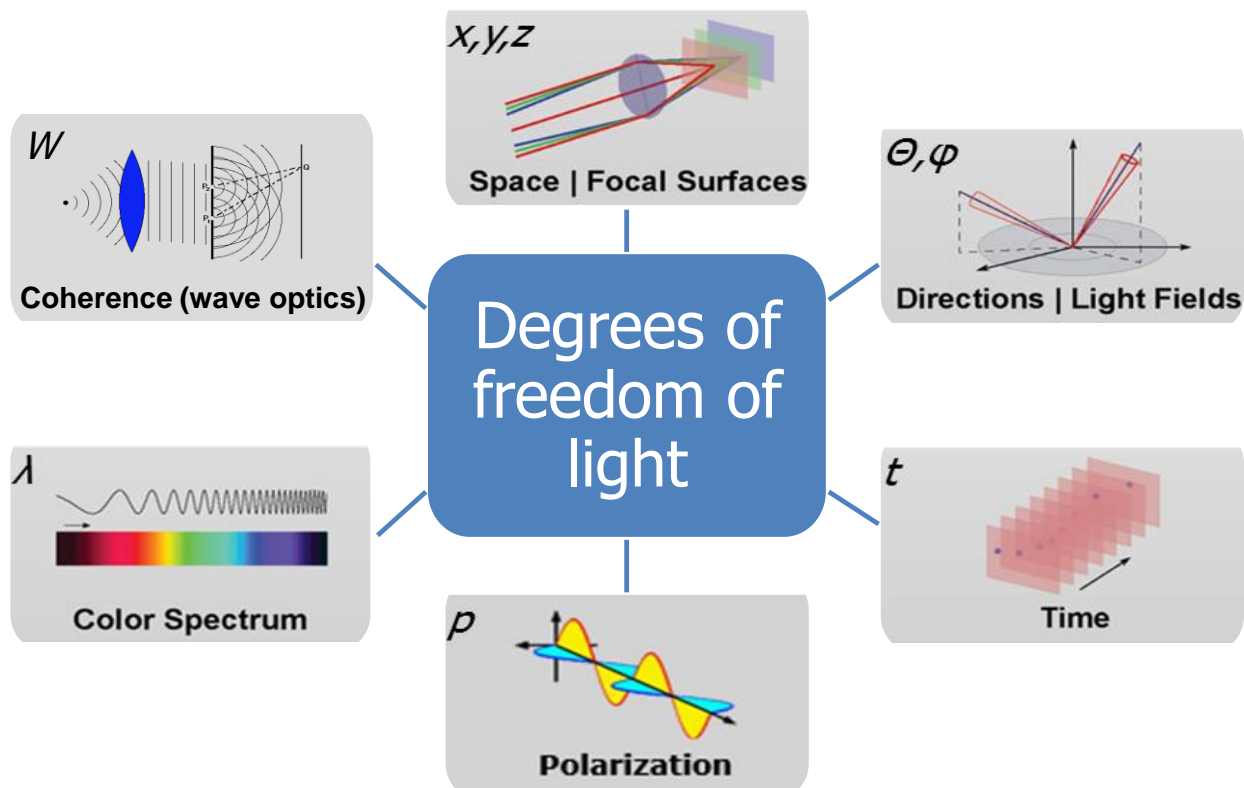


Boeing Unmanned Little Bird



# Seeds of Technological Surprise

Imaging technologies for full 3D scene reconstruction from a single viewpoint



Seeing the "unseeable"



[www.darpa.mil](http://www.darpa.mil)