Air Force Research Laboratory

INFORMATION DIRECTORATE

Core Technical Competencies (CTCs) Focused in Four Major Technical Areas of Research

Autonomy, Command & Control and Decision Support

Mastering complexity of multi-domain command & control.

Vision: Mastering and imposing complexity to command & control future multi-domain operations in an evolving battlespace with speed and scale.

Mission: Deliver revolutionary, trusted, affordable information technologies for agile, resilient and distributed Air Force command & control and autonomous systems.

Sub CTCs: 1. Complex Adaptive Systems 2. Complex Effects Analysis 3. Machine Intelligence

Goals: Master complexity through development of adaptive C2 systems-of-systems and services. Control, impose and synchronize complex MD effects chains. Harness machine intelligence to increase C2 speed and scale of operations. Realize large-scale multi-agent systems for autonomous planning, tasking and execution.

Connectivity and Dissemination

Putting the right information into the right hands at the right time.

Vision: Seamless, resilient networked communications fabric across the command and control intelligence surveillance reconnaissance (C2ISR) enterprise, assuring delivery of timely, reliable and actionable information to warfighters and systems.

Mission: Provide agile and secure mission-responsive communications and information exchange globally.

Sub CTCs: 1. Communication Links and Networks 2. Secure Multi-domain Architectures 3. Mission-Responsive Information Exchange

Goals: Agile and secure communications and networks. Agnostic connectivity. Autonomous link discovery, creation and utilization. Dissemination of information at need, securely.

Cyber Science and Technology

Leveraging and shaping the cyber domain to the nation's advantage.

Vision: Enable Air Force to conduct integrated multi-domain operations over an agile, trusted and resilient cyber infrastructure, through which we can project cyber power at a time and place of our choosing, with the same confidence and predictability already afforded to air and space operations.

Mission: Lead development of cyberspace science and technology necessary to address capability gaps and associated technical hard problems to establish cyberspace superiority and support the conduct of full-spectrum cyberspace operations integrated with other domains.

Sub CTCs: 1. Foundations of Trust 2. Cyber Resiliency 3. Network Exploitation 4. Integrated Cyber Operations

Goals: Enable hardware and software root of trust. Cyber resiliency to fight through and recover from attack; ensuring cyberspace superiority. Locate, acquire and process complex signals of interest. Integrate full spectrum cyber capabilities into multi-domain operations.

Processing and Exploitation

Exploiting computing and algorithms to transform big data into information.

Vision: Innovator of technologies which process and exploit data in near real time, analyze massive collections over time and employ continuous learning to deliver asymmetric decision speed to the Air Force.

Mission: Lead the discovery, development and transition of all-source multi-domain processing and exploitation innovations for the Air Force.

Sub CTCs: 1. Automated Exploitation 2. Multi-Source Analysis 3. Architectures for Massive Analytics

Goals: Manage, process and exploit massive amounts of intelligence surveillance reconnaissance (ISR) data. Exploit targets in denied areas. Process ISR information via high performance systems. Energy efficient computing.