



National Security Engineering Center | FFRDC

The National Security Engineering Center (NSEC), a federally funded research and development center (FFRDC), provides broad-based technical, scientific, analytic, and enterprise systems engineering support to the Department of Defense (DoD), Intelligence Community (IC), and their partners in the national security mission.

Helping to Shape the Nation's Changing Defense Landscape

For more than 50 years, MITRE has served the DoD and the IC as a strategic partner, delivering broad and deep technical expertise that is independent and free from conflict of interest. We have both the historical perspective and institutional memory to support mission-critical capabilities, promote enterprise-level solutions, and enhance system interoperability and cybersecurity.

As the worldwide defense landscape changes, the U.S. military is changing as well, evolving into a joint force that is smaller, leaner, more agile, and technically advanced. Our warfighters and intelligence professionals must have cutting-edge capabilities that provide a technological and networked advantage.

NSEC plays a vital role in this mission. We provide a disciplined approach to systems engineering and enterprise integration, and develop innovative technologies across a wide range of mission areas. We work closely with customers, commercial industry, other FFRDCs, academia, and the broader research community to apply the best expertise available to accelerate new capabilities. NSEC does this all while balancing capability improvement with cost containment. Three goals guide our work: dramatic performance improvement, reduced system costs, and accelerated delivery to the field.

Applying an Independent Perspective to Complex Challenges

MITRE's broad-based work program, independent perspective, and systems engineering expertise uniquely position us to address some of the DoD's and IC's most vexing challenges. For the DoD, we place special emphasis on creating joint systems to aid today's emerging missions. For the IC, we support U.S. intelligence agencies, military intelligence organizations, and combatant commands.

We aim for integrated solutions, in which systems work together seamlessly even if they are developed independently. We look for opportunities to work across our customer base to ensure that systems, services, and data can be shared within and across diverse missions.

At locations around the world, we provide our government sponsors with strong technical capabilities in systems engineering, modeling and simulation, acquisition strategy and management, enterprise engineering, and information technology. Decades of MITRE research and development on sensors, electronics, digital systems, and cybersecurity enable NSEC to address the evolving challenges of the 21st century.



The FFRDCs that MITRE operates take on tough technical challenges of national importance and provide leading-edge, practical, and cost-effective solutions. Here are some examples of recent MITRE achievements.



Helping Unmanned Aircraft “See and Avoid”

A MITRE team collaborated with the U.S. Air Force, the Volpe National Transportation Center, MIT Lincoln Laboratory, and Raytheon in developing the Ground-Based Sense and Avoid capability, which enables a remote pilot of an unmanned aircraft to “see and avoid” other aircraft. In 2014, MITRE joined with its partners in celebrating the first flight of remotely piloted aircraft using this system at Cannon Air Force Base in New Mexico.



Computer Vision Offers New Tools for Searching Video

A new branch of artificial intelligence known as computer vision employs algorithms to extract information from visual data—images, video, 3-D scans, infrared—and enables a computer to “see.” MITRE’s computer vision group has developed a program to enable computers to scan millions of frames of video to identify pertinent information. Computer vision offers tremendous potential for military applications, security, and law enforcement.



A Multi-Satellite, Multi-Sensor Approach

Positioning, navigation, and timing (PNT) resources play a vital role in military, intelligence, and aviation operations; however, an increasing number of threats poses new challenges. MITRE is working on a more resilient PNT capability based on a multi-satellite system, multi-sensor approach. This strategic vision is referred to as the “three R’s”: increase the *robustness* of GPS, develop *redundant*/diverse PNT capabilities, and advance the *removal* of threats.



Tough Minds in Tough Bodies

The Army worked with behavior specialists to understand what contributes to post-traumatic stress (PTS) and what cognitive skills can potentially enhance resilience and situational awareness. They identified 12 different resilience skills and six situational awareness skills that soldiers can learn. Based on this information, a MITRE team developed a program for building a “mental armor” that helps prevent PTS.

Smartphone Ad Hoc Networking

A MITRE team designed a networking system that enables specially equipped smartphones to form their own off-the-grid network in situations where other communication networks are damaged or nonexistent. In 2014, a MITRE team demonstrated Smartphone Ad Hoc Networking at the Joint Interagency Field Experimentation event at Camp Roberts, California. MITRE has made the technology available through open source and plans to transition it to government and industry.