

USAF Scientific Advisory Board

Sensor Data Exploitation

Terms of Reference

Background

The Air Force continues to develop and field more radar, video, other electro optical/infrared, signal and other sensors (including advanced apertures on 5th generation fighters and other aircraft), providing increasingly higher volumes of higher fidelity data. This data stresses capacities of data links, and also floods available Air Force capabilities for exploitation of the data. Moreover, tasking and control of the sensors are inadequate, resulting in redundant and missing collections. The limited ability to turn sensor data into actionable knowledge limits the utility of the sensors and the platforms that host them. Advances in processing techniques, processing architectures, and processing hardware can lead to reduced demands on communications and manning while providing more actionable information.

Charter

The study will focus on Air Force-relevant technologies and systems for Intelligence, Surveillance, and Reconnaissance (ISR) of objects and people on the ground. Within that scope, it will:

- Identify sensor data and other information (e.g., multi-int, social media, cyber-derived) that does or will contribute to warfighter needs for intelligence; combat identification; decision-aiding; targeting; and battle damage assessment.
- Review and assess the state-of-the-art in sensor management and exploitation technologies, along with current Air Force systems and programs addressing sensor management and exploitation.
- Propose exploitation architectures, including those that make use of net-centricity, that current systems and programs can evolve to, and that can accommodate future sensor systems and programs.
- Identify promising technological approaches, at various levels of maturity, that will produce improved knowledge from available data sources in contested and congested environments through the use of:
 - Intelligence Preparation of the Battlespace (IPB) and other data bases to enhance tasking and management of sensors
 - Improved collection in the context of intended exploitation and application
 - Real-time or near-real time cueing of contributing sensors and human operators
 - Advanced techniques and technologies for exploitation, fusion, and processing at the sensor, with emphasis on video
 - Efficient use of communications capacity through approaches that include reduced collection redundancy, cueing, processing at the sensor, and data compression
 - Accounting for the attributes, credibility, latency, and pedigree of the data sources
- Identify technology needs and identify promising technological approaches that should be pursued to address near-term, mid-term, and far-term challenges.

Study Products

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