

USAF Scientific Advisory Board
2016 Study, Beginning January 2016

Data Analytics to Support Operational Decision Making

Terms of Reference

Background

The Air Force has invested heavily in a broad range of integrated Intelligence, Surveillance, and Reconnaissance (ISR) collection assets across air, space, and cyberspace that provide data feeds intended to support operational decision making. However, the sheer amount of raw data produced daily by these combined assets is enormous and far exceeds the current analytic capabilities of the Processing and Exploitation, Analysis and Production, and Dissemination (PCPAD) framework. Data sources are heterogeneous, span all domains, are spread over multiple networks and varying classification levels, and include vast amounts of stored historical data, including non-military and public source data. The scale of processing, exploitation, correlation and analyses needed to fully extract even a fraction of the potential information in these data can no longer be directly coordinated by human analysts. Yet there are other organizations, including large financial institutions and major telecommunication industries, that routinely use automated "massive data analytics" to support decision-making by identifying and analyzing rare and unpredictable events in comparably vast data streams from non-homogenous and disparate sources involving multiple security levels. The Air Force needs a better understanding of the extent to which such modern data analytics could augment/improve current ISR analysis approaches and help identify cross-database correlations, and how such capabilities could be effectively integrated in the current or future PCPAD framework.

Charter

The study will:

- Survey current use of massive data analytics in relevant large data-intensive commercial and non-DOD government enterprises as well as the intelligence community to assess their use and effectiveness for anomaly detection, characterization, and prediction.
- Compare characteristics of data streams from Air Force ISR assets with those of such other enterprises, including factors including heterogeneity, asynchrony, anomaly characteristics, and others that may impact or limit Air Force ability to utilize data analytics.
- Assess the abilities of data analytic methods similar to those used by these enterprises to address aspects of ISR processing, exploitation, and analyses currently done by humans.
- Determine the extent to which automated data analytics with appropriate supporting infrastructure can enable improved processing, exploitation, and analyses of multi-source ISR data to support improved operational decision making.
- Identify unique training and education requirements needed to create an ISR workforce with necessary understanding of data science, visualization, and knowledge management to support effective use of data analytics in the Air Force global integrated ISR enterprise.
- Recommend and prioritize areas for research and development needed to enable large-scale data analytics suited to characteristics of the global integrated ISR environment.

Study Products

Briefing to SAF/OS & AF/CC in July 2016. Publish report in December 2016.