

Department of the Air Force Scientific Advisory Board
FY 2025 Study

Autonomy for Military Systems: Technical and Ethical Issues
Draft Terms of Reference

Background

Recent advances in AI and autonomy are proving to have a significant impact on warfare worldwide. These technologies enable new competitors to challenge established leaders in unprecedented ways. Most recently, AI has been shown to be useful for brainstorming, optimization, and production of images, music, and text – plans, prose and poetry for humans and software for computers. Unmanned systems have been employed by near-peer adversaries and terrorist organizations in recent conflicts in Ukraine, the Gaza strip, and around the world, offering the warfighter new options. Autonomy offers advantages when rapid decisions are required, when large quantities of heterogenous data must be analyzed, when links are intermittent, required actions are complex, the mission is dangerous, or persistence and endurance are critical to success. Past studies have identified responsible human-machine collaboration to be important, and DoD-wide AI ethical principles have been adopted.

Given recent advances in policy and technology and growing use of autonomy in commercial and military applications, the DAF SAB will revisit use of AI and autonomy in military systems, reviewing technical advantages and ethical application of AI ethical principles.

Charter

The study will:

- Identify DAF applications that could benefit from AI and autonomy technology, including;
 - Military planning and analysis
 - Battle Management, command, control and communications
 - Autonomous weapons systems (such as future Collaborative Combat Aircraft (CCA) concepts) and Low-Cost Cruise Missile applications (such as ETV/Franklin)
- Determine potential for near-peer nation application of AI and autonomy to military systems
 - Assess lessons-learned from Ukraine, Gaza Strip, and Red Sea conflicts
 - Review near-peer activities and plans
- Survey relevant and emerging AI and autonomous technologies and identify new potential capabilities and challenges.
 - Highlight best practices for testing, evaluation, verification and validation in order to ensure trustworthy and resilient systems
 - Determine ethical issues associated with use of AI for autonomous military systems for each of the areas listed above

Study Products

Briefing to SAF/OS in April 2025. Published report in September 2025.