INSIGHTS FOR THE THIRD OFFSET:

ADDRESSING CHALLENGES OF AUTONOMY AND ARTIFICIAL INTELLIGENCE IN MILITARY OPERATIONS

From the development of the crossbow to precision guided munitions, the ability to adapt technological advances to warfighting has led to fundamental changes in the character of war and the tools used in its conduct. Military operations are poised for another revolutionary change with the rapid and advancing progress in artificial intelligence, including the attribute of autonomy. To further drive this transition and bolster America's military deterrence, the U.S. Department of Defense developed the "Third Offset", which, in addition to other actions, calls for an asymmetric approach that aims to "exploit all the advances in artificial intelligence and autonomy … to achieve a step increase in performance … [to] strengthen conventional deterrence."

POTENTIAL CHALLENGES

This new approach comes with several potential challenges. First, the state of this technology has reached a tipping point where developments are dominated by the commercial industry and its many innovations. For example, the past two years have seen dramatic advances in which machines have been able to complete complex tasks and match or exceed human performance. Unlike in the government and military sectors, commercial development will be equally exploitable by many states—and by non-state actors. This means that the U.S. military will need to be *fast* and *agile* in identifying and incorporating emerging technologies—achieving this is a significant challenge as the military's standard acquisition system is rarely characterized by those two terms.

Second, with the advent of advanced technology and networked systems, achieving interoperability has proved to be a significant challenge. We find that the interoperability challenges faced by DoD could be *even more significant* for autonomous systems, requiring proactive measures to help ensure their effectiveness.

Third, the most controversial aspect of this new technology—should weapon systems operating autonomously (without a human operator) *be allowed to use lethal force*—could have significant impact on the ability and will of the U.S. to field and use such systems. This requires a robust effort to make sure systems are engineered and used in ways that learn from hard lessons from past U.S. operations; it also requires the U.S. working with multiple audiences—military forces, U.S. government leaders, allies, international forums, civil society groups, and media—to address potential challenges and help maintain appropriate freedom of action for such systems.

Many advances, some unforeseeable, are expected in the coming decades because of technological advances involving autonomy and artificial intelligence (AI). At the same time, the U.S. can take actions now to best prepare for these advancements and leverage them effectively. This report details four deliberate efforts needed in the near term to overcome key challenges in leveraging autonomy and AI in the Third Offset.

RECOMMENDATIONS

Aim to be an effective 'fast follower' of autonomous and AI technologies. This includes: building DoD technical expertise, prioritizing military R&D resources, monitoring and integrating commercial developments, tracking developments by near-peer countries, and conducting in-stride learning efforts to learn and adapt.

Prioritize interoperability of autonomous systems. This includes: maintaining a programmatic focus on interoperability, introducing policy requirements, reducing risk through live events, marrying experimentation with data and analysis.

Help lethal autonomous systems avoid inadvertent engagements, including: monitoring for misidentifications, incorporating robust IFF measures, leveraging available information for deconfliction, considering civilian casualties, developing DODD 3000.09 senior review criteria.

Promote freedom of action for autonomy and AI in operations, including: examining overall risks of lethal autonomy; providing extensive familiarization training for operators and operational commanders; developing a new approach to Test and Evaluation; developing an export policy for autonomy; identifying and addressing coalition friction points; having substantive engagement concerning autonomy with Congress, in international venues, and with civil society groups; and learning from the success of the Second Offset.

CNA CENTER FOR AUTONOMY AND AI

CNA's Center for Autonomy and AI supports the U.S. goal of effectively incorporating autonomy, AI, and related technologies in military capabilities. Throughout history, the ability to adapt technological advances to warfighting has led to fundamental changes in how war is conducted and the tools used in its conduct. Autonomy and AI represent revolutionary technologies in warfare which offer opportunities to the U.S. for countering and deterring emerging threats, addressing security challenges and advancing U.S. national interests. But this opportunity is by no means certain, since autonomy also offers potential asymmetric advantages to near-peer competitors, some of which have been pursuing these capabilities aggressively. Likewise, rapid innovation in the private sector and a commercial research and development sector dwarfing that of the U.S. military create new challenges for the U.S., which will need to quickly identify and integrate cutting edge technological developments in this rapidly changing environment.

Because of the foundational impact autonomy and artificial intelligence will have on the character of warfare, CNA created the Center for Autonomy and Artificial Intelligence to focus on these emerging technologies and their contribution to national security. The Center capitalizes on the ability to leverage the scientists and analysts of CNA's staff of 600, with their experience base in military operations, test and evaluation, security and intelligence analyses, technology assessment, and autonomy and AI.

ABOUT CNA CORPORATION

CNA is a not-for-profit research and analysis organization with 75 years of experience providing government agencies with data-driven insights and real-world, actionable solutions grounded in our direct experience with the operational environments where these solutions are applied. CNA developed the foundational techniques for operational analysis to address complex challenges facing government programs. We have applied these techniques successfully in areas ranging from defense to aviation, education, justice, and homeland security.

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