**Security risks and effective management of intelligent warfare**

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　　Since the 1990s, simulation, machine learning and autonomous weapons in the field of artificial intelligence have made great progress. Intelligent warfare represented by "algorithmic warfare" has shown completely different characteristics in terms of weapon platforms, combat styles, winning mechanisms, and war processes. For example, in April 2017, the U.S. Department of Defense established the "Algorithmic Warfare Cross-Functional Team" Maven project, whose main purpose is to use deep neural networks to classify images of videos transmitted by drones, so as to process the massive battlefield video data collected by drone clusters on a daily basis for the Department of Defense. The proposal of "algorithmic warfare" indicates that the current form of information warfare is accelerating from networking to a combination of networking and intelligence.

**Intelligent warfare presents new characteristics**

　　Full-depth, cross-domain combat space. From the perspective of combat space, future intelligent warfare will extend from the traditional single domain and single space to full-depth and cross-domain. The physical boundaries of traditional combat spaces such as land, sea, air, space, and network will be further broken, and the degree of integration of various combat spaces will be further deepened. The combat space will gradually achieve "seamless integration", and joint operations will still be its main combat method, but its specific form will change from integrated joint operations to cross-domain collaborative operations. "Cross-domain collaborative operations" in the era of artificial intelligence will mainly include factors such as cross-domain integration of combat capabilities, cross-domain interconnection of combat commands, cross-domain sharing of combat information, cross-domain interconnection of combat platforms, and cross-domain response of combat operations.

　　The winning mechanism of algorithm-based warfare. The winning mechanism of wars in different eras is also different. The killing mode of mechanized warfare is "surface killing" caused by large-scale troops and tank "blitzkrieg"; information warfare is "net killing" using electromagnetic equipment and network offensive weapons; and intelligent warfare is "point killing" by artificial intelligence weapons. The so-called artificial intelligence weapons refer to weapons that use artificial intelligence to automatically track, identify and destroy enemy targets. They are usually composed of information collection and management systems, knowledge base systems, decision-making support systems, and task implementation systems. With the development of artificial intelligence technology, future autonomous weapon systems will further present the characteristics of unmanned, miniaturized, invisible and clustered, and can accurately reconnaissance, surveillance and strike the enemy's command and control center.

　　Robot swarm combat mode. On the one hand, unmanned system swarm combat is conducive to reducing the cost of war. At present, the price of an advanced drone is about $1,000, and the cost of an ordinary helicopter can be converted into tens of thousands of drones. From the perspective of economic benefits, unmanned swarm combat may become the first choice for terrorists and extremist organizations to carry out retaliatory actions. On the other hand, swarm combat methods are also conducive to countries to deal with complex external security threats. War is no longer a symmetrical contest between evenly matched countries, but more of a non-state actor fighting in a non-linear or asymmetric way. For one's own war goals, in addition to winning the war, it is also necessary to further reduce "war consumption and war footprints", and robot swarm combat will become the first choice to meet these challenges. In the near future, intelligent unmanned systems will become "close friends" with manned systems on the battlefield, and independent combat of unmanned systems and mixed combat of "inanimate forces" and "living forces" will become the new normal of war.

　　Accelerated war decision-making process. John Boyd, a colonel of the US Air Force, once proposed a famous war decision-making process theory, namely the "Observe-Adjust-Decide-Act" (OODA) theory. When a conflict occurs between countries, whoever can complete the OODA process of war decision-making first can gain the initiative in the war. In intelligent warfare, the autonomous decision-making of machines also follows the four stages of information collection, information analysis, decision selection and action implementation, but its decision-making speed is much faster. The reasons are: First, it improves the situational awareness on the battlefield. Sensors and processors based on artificial intelligence can better perceive and collect information, thus simplifying the first and second stages of the decision-making process; second, it realizes command and control under human-machine collaboration, thus simplifying the third and fourth stages of the decision-making process. With the assistance of autonomous systems, the new command and control mode can be based on the real-time situation information of the battlefield, rolling out combat plans, dynamically issuing task instructions, moderately regulating combat operations, and accurately evaluating combat effectiveness, while accelerating the existing combat process, to achieve the optimization of combat effects.

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