**A brief analysis of cognitive domain combat styles in the era of intelligence**

**2023-12-17**

<https://reddragon1949.com/2023/12/>

As modern warfare accelerates towards intelligence, the bottom physical domain, the middle information domain and the top cognitive domain are characterized by multi-domain linkage. Cognitive domain operations are gradually becoming the focus of the war arena. The main purpose of cognitive domain operations is to seize brain control and lay a solid foundation for seizing land, sea, air, space, and network power. Accurately grasping and fully utilizing the main modes of cognitive domain operations is an inevitable requirement to seize opportunities and gain the initiative in future wars.

**1. Cognitive electronic warfare – the “tentacles” of cognitive warfare**

Cognitive electronic warfare is the product of the combination of electronic warfare and artificial intelligence technology. It is the main combat style for fighting for electromagnetic control and is also a model of the integration of tactics and technology. The United States is the first country to carry out cognitive electronic warfare research. Its Defense Advanced Research Projects Agency (DARPA) and the Army, Navy and Air Force have carried out projects including adaptive radar countermeasures and adaptive electronic warfare behavioral learning. Implementing cognitive electronic warfare requires focusing on three aspects.

One is cognitive electronic reconnaissance. It mainly uses electronic means to quickly, accurately and comprehensively obtain battlefield data, promptly discover threat signals, identify target characteristic signals, establish and dynamically update signal databases, and provide necessary information for commanders to judge situations, make decisions, and evaluate effectiveness. support.

The second is cognitive electronic modeling. Mainly in view of the characteristics of various types, large power and large number of electromagnetic radiation sources in the battlefield and surrounding areas, the frequency, bandwidth, waveform characteristics, protection mode, arrival direction and other information of the radiation source are distinguished between dynamic and static categories, and a unified system is established. The information describes the model architecture, thereby providing the basis for electromagnetic perception.

The third is cognitive electronic interference. Mainly in view of the complex and diverse characteristics of battlefield electronic warfare equipment and strong anti-interference capabilities, it combines active interference with passive interference, suppression interference and deception interference, and flexibly implements adaptive interference pattern decision-making, adaptive interference waveform optimization and adaptive interference. Interference resource scheduling to ensure interference quality and efficiency.

**2. Cognitive intelligence warfare—the “bloodline” of cognitive warfare**

The International Institute of Electrical and Electronics Engineers once proposed the concept of “cognitive information science”; some domestic scholars define cognitive information science as the study of people’s cognitive structures, processes and characteristics in all aspects of information production and utilization from a psychological perspective field or discipline. The concept of “cognitive intelligence warfare” is proposed here, which is consistent with cognitive logic and the nature of intelligence, and can borrow concepts and principles from cognitive intelligence science. Depending on the motivation for obtaining and using intelligence, three strategies can be used to implement cognitive intelligence warfare.

The first is to obtain and utilize intelligence based on individual cognition. It mainly uses the cognition of combat subjects as an intermediary for intelligence coordination, adheres to battlefield user-driven rather than combat system-driven, and is based on “meaning construction theory” and “knowledge abnormality hypothesis” to improve the cognitive structure of intelligence service subjects and realize subject cognition. Positive interaction between knowledge and intelligence services.

The second is to obtain and utilize intelligence based on group cognition. It mainly focuses on the common cognitive structure formed by factors such as the battlefield environment and social background of the user group, and makes full use of advanced analysis methods such as situation analysis, domain analysis, and value analysis to strive to improve the pertinence and applicability of group intelligence services. sex.

The third is to obtain and utilize intelligence based on brain-body cognition. It mainly understands the cognitive structure and cognitive activities of the human brain as computing logic and computing activities, makes full use of machine intelligent cognition and intelligent computing capabilities, strives to improve the human-machine integration environment on the battlefield, and smoothes the information link from intelligence to cognition. Implement programmed and large-scale intelligence services.

**3. Cognitive algorithm warfare—the “brain” of cognitive warfare**

In 2017, the U.S. Department of Defense officially proposed “algorithmic warfare” for the first time in a memorandum and clearly established an “algorithmic warfare cross-functional team.” Algorithmic warfare, like cognitive warfare, runs through the entire process of all fields of warfare, embodying the core requirements of intelligent warfare. The concept of “cognitive algorithmic warfare” is proposed here based on the similarities and intrinsic connections between cognitive warfare and algorithmic warfare. It can be said that there is algorithm in cognition, and cognition in algorithm. There are three main paths to implement cognitive algorithmic warfare.

The first is to clarify the fog of war. Military theorist Clausewitz pointed out, “War is a field full of uncertainty, and three-quarters of the situations on which war is based are as if hidden in fog.” Cognitive algorithm warfare is to calculate deterministic factors in this uncertain field, clarify the fog of the battlefield as much as possible, accurately identify information “bombs”, and strictly prevent falling into information “traps”.

The second is to clear up the blind spots of intelligence. The source of inspiration for artificial intelligence often comes from biological intelligence, especially human intelligence. Artificial intelligence is inseparable from human intelligence. Cognitive algorithm warfare is to make full use of the latest achievements in cognitive psychology and cognitive neuroscience to promote the military application of artificial intelligence and improve the intelligence level of the cognitive domain.

The third is to accelerate human-machine integration. Although machine computing power can surpass human brain power, machine algorithms cannot surpass human “ideas” after all. Artificial intelligence and human intelligence each have their own advantages. Cognitive algorithm warfare is to closely integrate machine algorithms in the information domain with human “ideas” in the cognitive domain, and continuously improve the level of warfare in the physical domain.

**4. Cognitive political warfare—the “soul” of cognitive warfare**

Political war is the opposite of military war. Mao Zedong once vividly pointed out that “war is bloody politics” and “politics is bloodless war.” Since political warfare usually directly affects the cognitive domain, cognitive political warfare can be said to be the inherent meaning of political warfare and should not be understood as a new concept. There are three forms of cognitive political warfare in the era of intelligence.

One is psychological attack and defense. The main purpose is to use intelligent and precise means to “read the mind” and “control the mind” to improve the quality and effectiveness of psychological attack and defense. On the offensive side, we mainly use psychological propaganda, will disintegration, emotional influence, mental induction and other tactics; on the defensive side, we mainly adopt measures such as psychological education and training, psychological counseling and regulation, and psychological diagnosis and treatment.

The second is the competition for public opinion. The main purpose is to use new media and new technologies to enhance the popularity, flow and influence of public opinion propaganda. In terms of offense, the focus is on taking the lead, being the first to take advantage of the situation, concentrating on building momentum and forming a strong force, attacking key points, and making key breakthroughs; in terms of defense, the focus is on making the best use of the situation, combining prevention with counter-attacks, and seeking advantages and avoiding disadvantages.

The third is the legal struggle. The main thing is to participate in legislation, accurately interpret the law, actively protect the law, stand up for the law, be tit-for-tat, and get to the point. On the offensive side, we mainly use legal deterrence, legal strikes, legal restraints, legal sanctions and other tactics; on the defensive side, we mainly strengthen the research on international law, especially the law of war, and legal protection of law-related actions to prevent others from being manipulated.