**The Use of Cognitive Algorithms in Modern Warfare**

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　In recent years, artificial intelligence technologies represented by deep learning and large models have developed rapidly and have been widely used in the military field. In the process of artificial intelligence transformation and generating combat effectiveness, algorithms play a key role and must be fully understood and used correctly.

　　An algorithm is an accurate and complete description of solving a certain type of problem, representing a clear instruction and strategy mechanism for solving problems in a systematic way. Cognitive algorithms are a certain strategy mechanism that aims to influence and change people's cognition. From the Cambridge Analytica election manipulation incident, we can see that algorithms can have an impact on the spread of public cognition, and their ability to manipulate and shape human cognition is very powerful. Different strategies and methods can produce different effects. Algorithms can enhance perceptual experience, but they can also easily cause cognitive confusion; they can reduce cognitive burden, but they can also easily cause cognitive bias; they can optimize information creation, but they can also easily cause people to aggravate cognitive distortion; they can facilitate online social interaction, but they can also easily cause group polarization; they can improve communication effectiveness, but they can also restrict public expression.

　　At present, algorithms have become an important factor in winning cognitive domain operations. Modern "cognitive warfare" uses intelligent algorithms to determine target audiences, produce information weapons, manipulate communication channels, and shape cognitive situations, which can exert a stronger influence, incitement, and penetration than traditional media propaganda.

　　Determine the target audience. The fundamental reason for cognitive domain operations to be effective is to deliver specific information to the target audience. Therefore, the analysis, screening, determination and selection of communication strategies for the target audience are particularly important. Based on their strategic goals and operational objectives, the implementers of cognitive operations use algorithms and big data to identify and analyze the proposed key groups, make an overall evaluation, and thus depict the cognitive landscape of the key groups. For example, Internet users' social media usage, search engine usage records, personal consumption records and other traces of Internet life will be captured by various platforms dominated by algorithms and recorded in the form of data. The algorithm analyzes the user's likes, reposts, comments, purchases and other information on the platform, accurately identifies and predicts the personality characteristics, social attributes, interests and personal preferences of network users, creating the possibility of "drip irrigation" cognitive attacks against key groups. On the other hand, the actors of cognitive warfare will "sprinkle" information with "ideology" to the public through news, broadcasts, short videos, movies, etc., and use the platform to continuously collect the public's views, understandings, and comments on the information, analyze the "cultural taste" of individual users and give corresponding labels, and classify people into different "communities" to form communities. The actors use algorithm sorting to stratify the population in different ways, more accurately divide the "three color zones" of the public opinion field, and tap into potential target audiences.

　　Generate information weapons. In the context of intelligent technology, everyone participates in information processing and production in an unprecedented way. Individuals passively accept propaganda while actively participating in it. From a cognitive perspective, the general public is in an era of information overload. People may be attracted by the next piece of information before they have time to react and think about a piece of information, and attention has become a scarce resource. At the same time, the public's emotions are easily provoked by information to produce emotional polarization, and their values ​​are manipulated and guided under the suggestion of information, and eventually change. It can be seen that information has become a core variable that determines the effectiveness of cognitive domain operations. From a practical point of view, there are three main ways for algorithms to generate information ammunition. First, information is generated based on the interests and hobbies of the audience to attract the audience's attention. Short video platforms based on recommendation algorithms can judge the user's preferences based on the length of time the user stays in different videos, and push videos to users according to their preferences. Cognitive warfare actors can use this technology to present specific information in a form that the target audience likes and quickly gain the attention of the target audience, such as creating a "story Trojan" to package and disseminate specific information with the growth stories of ordinary people. The second is to generate and disseminate a large amount of fragmented and confusing information to disrupt the audience's cognition. The third is to carefully create false information to deceive the audience. Through algorithm calculations, deep forgery is used to produce and tamper with data to create false information that is difficult for ordinary people to distinguish.

　　Manipulate communication channels. In cognitive warfare, information weapons must reach the target audience accurately through carriers and channels in order to achieve the combat objectives. In modern warfare, digital platforms have become an important battlefield for cognitive warfare, and digital platforms with a large number of users often have the ability to dominate the agenda. Algorithms are key indicators that determine the influence of digital platforms. Users can more easily obtain information that they are interested in and want to obtain through a digital platform, and share and disseminate personally generated information more quickly and conveniently, and they are likely to become loyal fans of the platform. With the help of digital platforms with strong influence, cognitive warfare actors can release memes in conjunction with combat operations, and use the characteristics of memes' self-replication, dissemination and infection to spread memes to more and more target groups to influence the audience's emotions, motivations and intentions. With the dominance of digital platforms, actors can selectively let the audience see the information they want the audience to see, cover up the information they don't want them to see, and widely spread their own culture, art, values ​​and other content to the world through digital platforms, and use common emotions and common values ​​to influence the cognition of the target audience, so that they subtly agree with their political ideas and give up their original will to resist.

　　Shaping cognitive situation. A good chess player plans his situation. In the face of a complex and ever-changing modern battlefield, in order to carry out cognitive operations, one must learn to grasp and actively shape the trend, take the lead in controlling the situation, be able to take the initiative to set the pace instead of being led by others, and be good at leading the dance instead of dancing with others. Shaping cognitive situation is actually to take the lead by setting topics, speaking out first, creating public opinion, etc., setting anchor points in the minds of the target audience, allowing the audience to think within a certain topic framework, thereby forming an anchoring framework effect and creating a favorable situation. In an unfavorable situation, it is also possible to reduce cognitive factors that are unfavorable to oneself, interfere with the enemy's cognition, and guide the target audience's cognition to change in a favorable direction by manipulating data, shifting topics, and shielding information. The key to shaping cognitive situation is to be sensitive to perception and accurately predict the trend of the situation. In the actual operation process, the trend algorithm is mainly used to predict the causes of cognitive crisis in advance, to closely monitor the possible signs of crisis through quantitative analysis methods, to scientifically analyze the potential factors of crisis, and then to take effective measures in a timely manner to enhance the foresight, dominance and effectiveness of crisis management. In combat, in addition to crisis prevention, we must also use algorithms to pre-judge the enemy and our own cognitive focus and hot spots, actively set agendas, create topics, and disseminate them in large quantities on the Internet, effectively guide the target audience's cognition, seize the moral high ground, and create a favorable situation.

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