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War Mind©: The smart use of AI in warfare

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Abstract

Artificial intelligence (AI) is transforming industry, education, and every human activity in a way that is unlike any other technological revolution in the past. In this sense, warfare and the weaponry used in it are also undergoing rapid and enormous transformation. AI is profoundly changing all elements of modern warfare, with a significant influence on operations in the field, as well as on planning and strategy led by the military high command. This paper provides the keys to what is currently happening in armed and hybrid conflicts in various regions of the world and shows some applications from Proxima Alpha, Inc.'s proprietary AI system devoted to geopolitical analysis, called War Mind©, which is already operational in some institutions.

Keywords: Geopolitics; Mathematical Combat Simulation; Hybrid Conflicts; AI Warfare; War Mind© Applications.

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War Mind©: The smart use of AI in warfare

In 2025, an article published in the online journal *War Room* stated the following: «The rapid advancement of artificial intelligence (AI) is transforming industries at an unprecedented pace, and the business of warfare is no exception. AI-enabled weapons are reshaping modern warfare with significant implications for strategic planning, battlefield operations, and the ethical employment of military force. Nations are racing to integrate AI into military operations, with Ukraine and Russia at the forefront of developing autonomous systems for battlefield advantage»¹.

Warfare Data and Mathematical Algorithms

Russia's invasion of Ukraine on February 24, 2022, and the subsequent development of the war which, according to Russian strategy, was supposed to be quick and decisive in its conclusion, has shown that territorial domination in that case was not possible as Russia had initially planned. In contrast, the appearance of weapons in the form of swarms of drones has changed, perhaps forever, the nature of modern warfare. It is in this context that the importance of artificial intelligence (AI) as an irreplaceable element in the management of war arises, both in its operational strategies and in the use of new weapon systems.

However, before continuing with the importance of AI in warfare and defense, let's briefly analyze what AI represents and what does it consist of. Basically, AI is built from three distinct elements, which combine with each other to form the different archetypes of AI. These are: data, algorithms, and computer systems.

Regarding data, in the *Art of War*, as Sun Tzu said, the intelligent use of data is fundamental to victory. One of his aphorisms is conclusive: «If you know the enemy and know yourself, you need not fear the outcome of hundred battles»². This leads to the need to know the strength, position, maneuvers, and weaknesses of the adversary, as well as the opponent's own situation, including their potential allies and how these allies will support them to avoid defeat. In war there is plenty of data to consider, including: (1) intelligence data, such as surveillance and reconnaissance to identify the enemy's capabilities, intentions, and movements; (2) operational and logistical data related to information on troop deployment, resource allocation, and supply chains, which are critical to the sustainability of the mission's combat operations; (3) environmental data, such as terrain information and weather patterns, which can affect tactical decisions; and last but not least, (4) communications and cyber data, which could be used to disrupt the enemy's command and control.

This takes us to a fundamental principle of artificial intelligence, which this author frequently invokes: « If the data fed into the AI system is 'garbage', the output of the AI process will also

¹ D. Kirichenko. *Artificial Intelligence's Growing Role in Modern Warfare*. War Room Online Journal. August 21, 2025. Accessed on February 18, 2026.

<https://warroom.armywarcollege.edu/articles/ais-growing-role/>.

² Sun Tzu. *The Art of War*. Translated by Lionel Giles. May 19, 2004. Chapter 4. *Attack by Stratagem*. Aphorism 18. pp. 42. <https://dn790006.ca.archive.org/0/items/TheArtOfWarBySunTzu/ArtOfWar.pdf>. Accessed on February 18, 2026.

be “garbage”». Not only because of the well-known problems of AI hallucination, but also because it is essential that the data made available to AI algorithms and computing systems be perfectly curated. Otherwise, AI will be, in addition to the enemy that the high command wants to defeat, an extra opponent in decision-making.

In the case of algorithms for simulating warfare, it has been recognized since the time of Frederick W. Lanchester (1868-1946), that the conduct of war is not only based on intuition or military knowledge based on experience, but also on translating the keys to combat into mathematical formulas with the idea of making ‘more scientific’ decisions. It is therefore understandable, that AI is regarded as an additional element that enables combat operations to be carried out in such a way that commanders can manage what distinguishes any war: its dynamic and unpredictable nature, since ‘relationships’ with the enemy are always characterized by complex interactions that require enormous flexibility and adaptation. Therefore, in simple terms, any army must consider, at least, two important aspects: the number of troops (i.e.: military capabilities) deployed, and their effectiveness on the battlefield (i.e.: the damage they can inflict on their opponents’ military capabilities).

This is where Lanchester-type equations of warfare come in. In their most basic form, these formulae describe a force A with a number of troops x , and an effectiveness α , measured in terms of the number of enemy units (y) eliminated per x per unit of time t , which fights against a second force B with a number of troops y , and an effectiveness β , measured in terms of the number of enemy units (x) eliminated per y per unit of time t . Thus, in the simplest combat scenario envisaged by Lanchester, there are only two ways to improve the fighting power of a force: either increase the number of troops and resources allocated to the war (the force’s strength) or increase the force’s lethality. Equations that mathematically can be written as follows:

For force A:

$$\frac{dx}{dt} = -\beta y \quad [1]$$

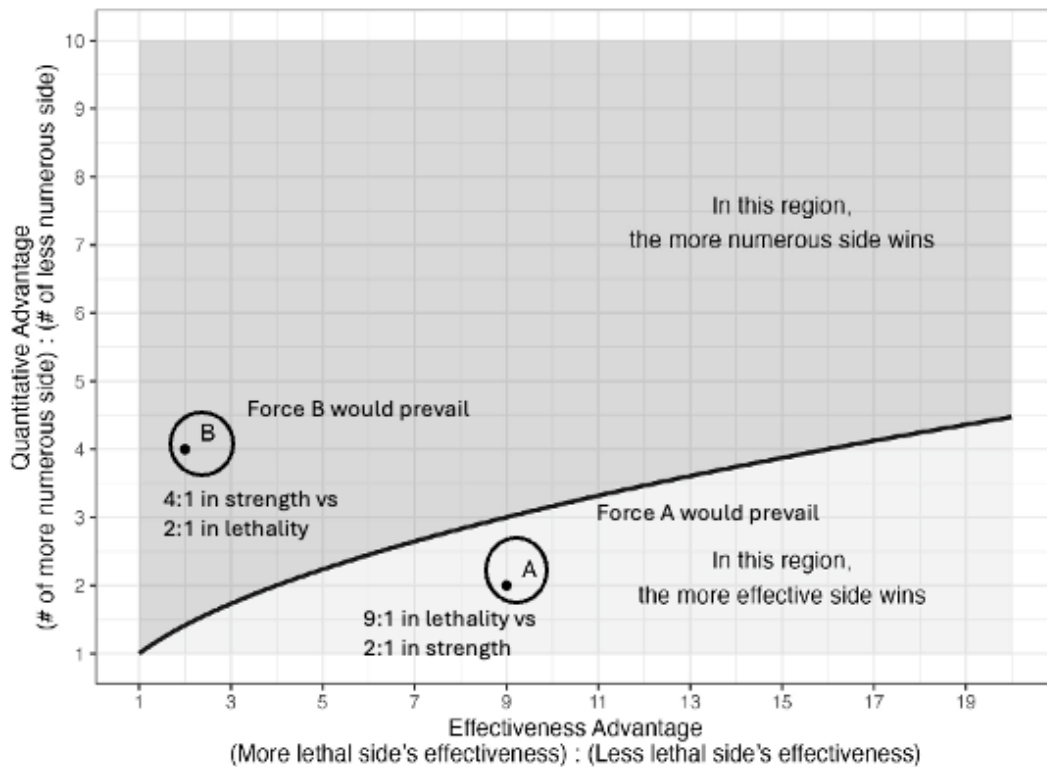
and for force B:

$$\frac{dy}{dt} = -\alpha x \quad [2]$$

Figure 1 shows an example of the above equations according to the analysis provided by Zachary Burdette *et al*³.

³ Z. Burdette *et al*. *How Artificial Intelligence Could Reshape Four Essential Competitions in Future Warfare*. Research Report. RAND Co. January 22, 2026. Accessed on February 18, 2026. https://www.rand.org/pubs/research_reports/RRA4316-1.html. Some comments by the author.

Figure 1. Strength vs lethality of two combat forces A and B (example)



Source: Z. Burdette et al. *How Artificial Intelligence Could Reshape Four Essential Competitions in Future Warfare*. Research Report. RAND Co. January 22, 2026.

The above equations introduce us to the combat models that have traditionally been used: war games; combat simulations; and analytical models.

Following James G. Taylor and without going into excessive detail, it can be said that a war game attempts to model a military confrontation through a process that analyzes the interactions between opponents, considering a set of defined rules imposed by an external arbiter. As for simulation, it means acting according to the parameters that appear in real combat situations. In the case of warfare, methods based on Monte Carlo mathematical techniques are often used, which simulate reality by considering the analysis of repetitive samples⁴.

However, given these considerations, the model expressed in the preceding equations (equation 1 and equation 2) can become exponentially complicated when analyzing different scenarios, which in the past has led to the development of a highly complex mathematical framework for warfare; which, in principle, according to the aforementioned James G. Taylor, a professor of operations research at the Naval Postgraduate School in Monterey (California), can be divided into the following areas: (1) stochastic combat models; (2) optimal fire distribution strategies; (3) empirical verification; (4) different functional forms for attrition rates; (5) applications to guerrilla warfare; (6) prediction of attrition rate coefficients; (7) variable attrition rate coefficients; and (8) complex large-scale planning

⁴ Taylor, J.G. *Lanchester-type models of warfare*. Vol I. Naval Postgraduate School. Monterey, California. 1980. pp. 10-20.

models. The mathematical representations of the various combat models developed by different authors, as shown in figure 2, display increasing complexity in accordance with the number of variables considered, as well as the interrelationships among them. This aspect, however, is not the focus of this paper, although it could be the subject of future work on this specific topic.

Figure 2. Development of the major areas of the Lanchester theory of combat

<u>Stochastic Combat Models</u>		<u>Variable Attrition-Rate Coefficients</u>	
KOOPMAN (1940's; see MORSE and SNOW (1940))	and KIMBALL (1951)	KOOPMAN (1940's; see MORSE and H. K. WEISS (1957)	KIMBALL (1951)
G. WEISS (1962)	SMITH (1965)	FARRELL (1970)	BONDER (1964)
KISI and HIROSE (1966)	HELLMAN (1966)	TAYLOR and PARRY (1975)	TAYLOR (1971, 1974c)
SPRINGALL (1968)	CLARK (1969)	TAYLOR and COMSTOCK (1977)	TAYLOR and BROWN (1976)
GRUBBS and SHUPFORD (1973)	KARR (1974, 1975a, 1975b, 1976)		
SHUPFORD and GRUBBS (1975)	WATSON (1976)		
<u>Optimal Fire-Distribution Strategies</u>		<u>Optimal Fire-Support Strategies</u>	
A. <u>General</u>	b. <u>Optimal Air-War Strategies</u>	C. <u>Optimal Fire-Support Strategies</u>	
ISRELL and MARLOW (1956b)	MORSE and KIMBALL (1951)	H. K. WEISS (1957, 1959)	
TAYLOR (1973, 1974a, 1974d, 1975)	GIAMBONI, MENGEL, and DISHINGTON (1951)	KAWARA (1973)	
	MENGEL (1953, 1954)	TAYLOR (1974, 1977)	
	FULKERSON and JOHNSON (1957)	TAYLOR and BROWN (1978)	
	BERKOVITZ and DRESHER (1959, 1960)		
	BRACKEN, FALK, and KARR (1975)		
	ANDERSON, BRACKEN, and SCHWARTZ (1975)		
<u>Different Functional Forms for Attrition Rates</u>		<u>Empirical Verification</u>	
PETERSON (1953, 1967)	ENGEI (1954)	<u>Applications to Guerrilla Warfare</u>	
BRACKNEY (1959)	H. K. WEISS (1957, 1966)	DEITCHMAN (1962)	
HELLMOLD (1965)	HELLMOLD (1961a, 1961b, 1964a, 1964b, 1971)	KISI and HIROSE (1966)	
	WILLARD (1962)	SCHAFFER (1968)	
<u>Prediction of Attrition-Rate Coefficients</u>		<u>Large-Scale, Complex Planning Models</u>	
BRACKNEY (1959)	BONDER (1964, 1967, 1970)	GIAMBONI, MENGEL, and DISHINGTON (1951)	
SCHAFFER (1968)	BARFOOT (1969)	SISKA, GIAMBONI, and LIND (1954)	
CLARK (1969)	BONDER and FARRELL (1970)	BONDER (1964)	
KIMBLETON (1971)		CLARK (1969)	
		BONDER and FARRELL (1970)	
		BONDER and HONIG (1971)	
		FARRELL (1975)	
		CHERRY (1975)	

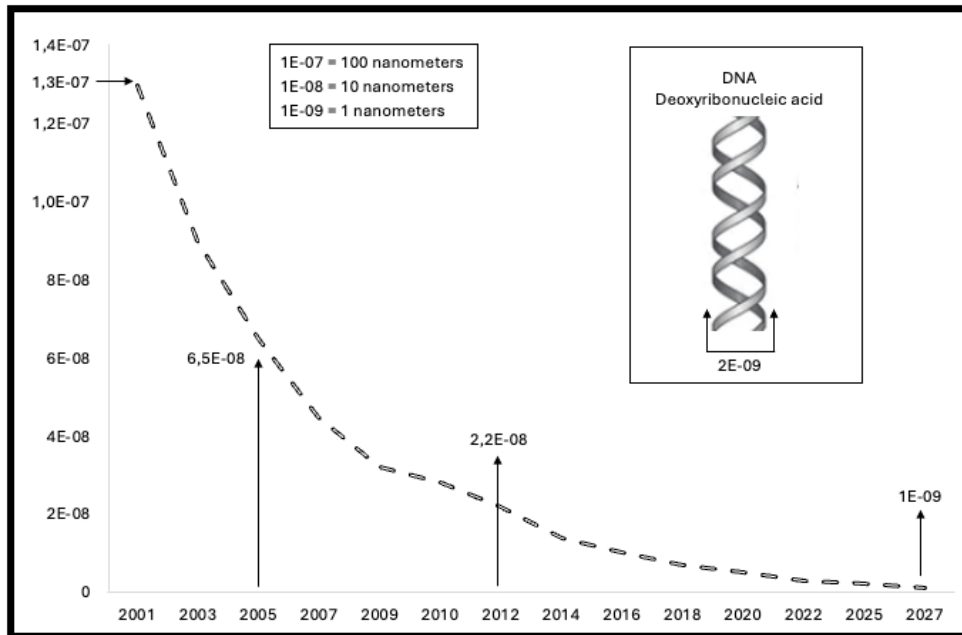
Source: Taylor, J.G. *Lanchester-type models of warfare*. Vol I. Naval Postgraduate School. Monterey, California. 1980. p. 122.

The Geopolitics of Semiconductor Manufacturing

The third element of artificial intelligence (AI) is based on computing; that is, the ability to efficiently and extremely quickly manipulate billions of numerical, alphanumeric, voice, and image data, from thousands of different sources that are managed by complex algorithms through equally complex structures, such as neural networks, to be subsequently processed in different mathematical optimization mechanisms, like the application of evolutionary strategies, which are complemented by reliability analyses employing, for example, the Monte Carlo simulation method, also incorporating sampling techniques to reduce the sample size.

When it comes to computing, it should be noted that current semiconductors —chips in traditional language— are capable of handling this immense volume of data and complex algorithms thanks to the impressive integration of transistors —according to Moore's Law— embedded in them (which currently reach a size equal to or less than 3 nanometers), and their computational programming to provide solutions that aid in decision-making by the general staff involved in defense activities or in warfare itself (figure 3).

Figure 3. Semiconductor miniaturization process



Source: Author's own work based on Wikipedia, illustrating the current application of Moore's Law⁵

From the above, computer systems based on powerful microprocessors that manipulate complex AI systems used in autonomous weapons (drones or other types of combat systems), as well as computer systems that support the decision-making of military commanders, are fundamental in AI-based warfare. This innovation brings AI-based warfare into the geopolitical arena, whereby several nations compete to dominate the world of chips, with leading companies mainly located in Taiwan, South Korea, the United States, and China, where these last two nations are also extending their geopolitical conflicts into the realm of artificial intelligence, with Taiwan —and particularly TSMC (Taiwan Semiconductor Manufacturing Company)— being a major target in this Sino-American dispute.

Using Proxima Alpha's War Mind[®] AI Geopolitical System

By combining the three key elements that are the building blocks of AI (data, algorithms, and computing), the US-based firm (also operating in Europe) Proxima Alpha, Inc. (<https://www.proximaalpha.com>) has developed the War Mind[®] AI geopolitical system.

Proxima Alpha's War Mind[®] is a system geared toward geopolitical analysis and global conflicts using an AI proprietary system developed in-house. In this sense, the concept of war examined by War Mind[®] is not only related to existing or potential armed conflicts between established nations, but also to the enormous scenario of hybrid wars that are triggering military actions in the 21st century, as demonstrated by the recent case of the United States' incursion into Venezuela on January 3, 2026. This military action was intended to counteract the influence of drug cartels, an issue that has nothing to do with an armed

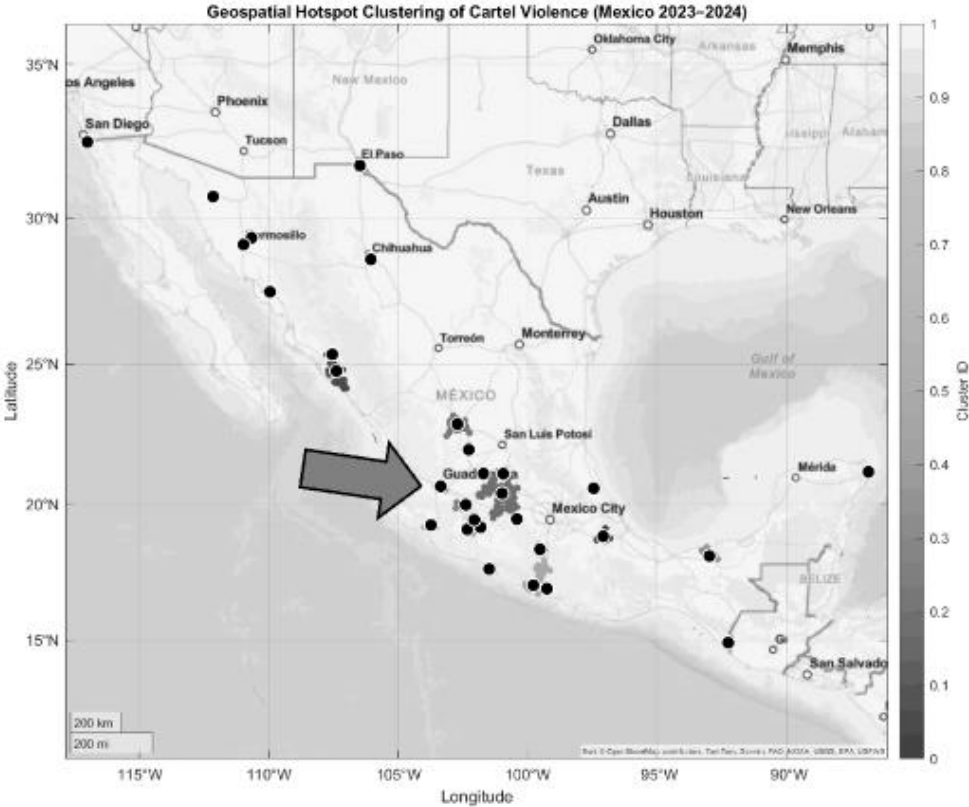
⁵ The 5nm process. Wikipedia: https://en.wikipedia.org/wiki/5_nm_process. Accessed on February 20, 2026.

confrontation between two nations, such as the United States and Venezuela, but rather falls within the framework of defending American interests in the face of the influential power of drug proliferation in the country.

To this aim, in October 2024, a Mexican institution requested Proxima Alpha to assess future trends in cartel-related violence. The analysts of Proxima Alpha asked the War Mind® AI system to answer that query with several prompts such as this: *How can the Mexican government develop a step-by-step analytical framework—including the prediction of geospatial hotspots—to simulate cartel fragmentation and anticipate future patterns of violence using GED and ACLED data from the last two years? Include maps showing cartel groups.*

On that occasion the institution requesting above analysis to Proxima Alpha did not provide its own data because it was considered to be classified, therefore War Mind® relied on public data provided by the UCDP GED (Uppsala Conflict Data Program Georeferenced Event Dataset) and ACLED (Armed Conflict Location & Event Data Project), two of the main databases of armed conflict events worldwide, used to research conflicts and political violence. The geospatial analysis made by War Mind® identified 30 distinct cartels/clusters of cartel-related violence localized across Mexico. The map below (figure 4) displays these clusters colored by cluster ID, with centroid markers identifying the focal points of activity. Temporal density measures reveal cluster intensities, with some clusters showing higher frequencies of violent events per day, indicating hotspots of ongoing cartel conflict. In addition to this map, much more complementary information was provided to enable a better understanding of the situation and more effective decision-making (the map is provided here in black and white). An area where, as can be seen in figure 4, Nemesio Oseguera, “El Mencho,” the leader of the Jalisco Cartel and the most wanted drug trafficker in Mexico and the United States, was murdered on February 22, 2026.

Figure 4. Geospatial analysis of cartel-related violence located throughout Mexico

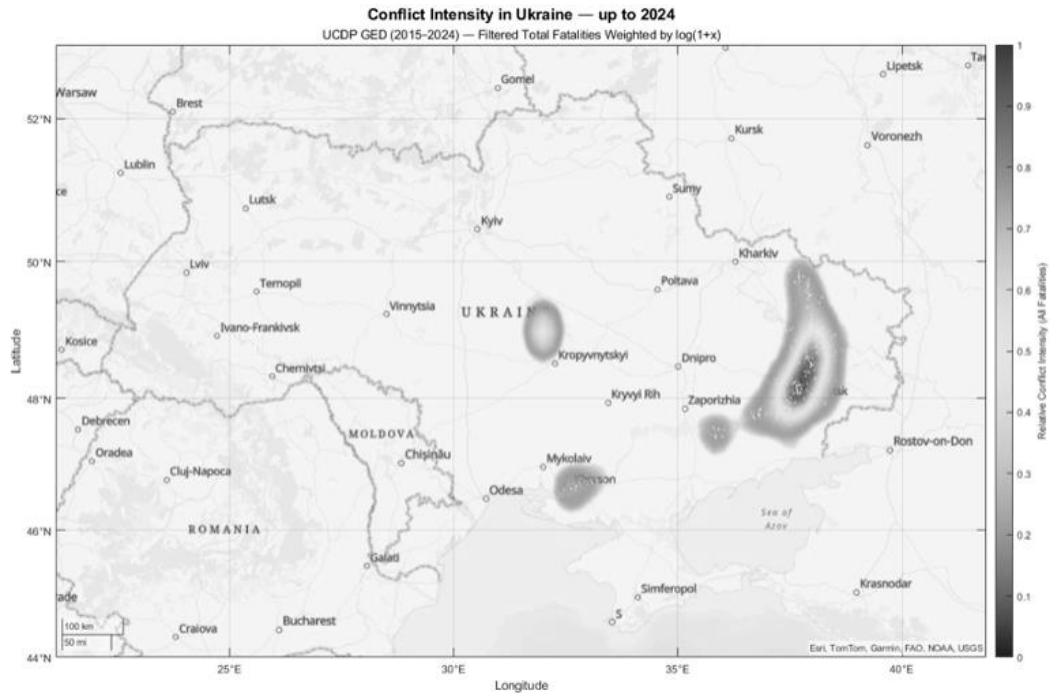


Source: Proxima Alpha, Inc.

Around the same time, a military institution belonging to the Spanish Ministry of Defense requested privileged information from Proxima Alpha about the possible evolution of the war in Ukraine, indicating in detail the hottest points of the war. The analysis had two objectives: the first was to assess the military evolution of the conflict, and the second to verify whether Russia would be able to take control of strategic locations such as the city of *Pokrovsk*.

Although the war began in February 2022, War Mind[®] generated an animated geospatial visualization to illustrate the evolution of conflict intensity in Ukraine between 2015 and the end of 2024, once again using event data from the UCDP GED. The visualization only highlighted areas with significant conflict activity, filtering out low-intensity regions (defined as areas with a relative conflict intensity of less than 8%). The result was a high-resolution GIF (Graphics Interchange Format) animation that clearly showed the geographical distribution and temporal changes of conflict hotspots, especially in the eastern regions of Ukraine, where the main escalations occurred. Although it is obviously not possible to show here the video of the events that led to the escalation during the period 2015-2024, Figure 5 shows the positions in October 2024 (although War Mind[®] includes colors, again, the map is shown here in black and white).

Figure 5. Intensity of the conflict in Ukraine by 2024



Source: Proxima Alpha, Inc.

Conclusion

From all that has been said in this article, in particular with regard to the use of artificial intelligence in the analysis of conflicts, it is clear that artificial intelligence has the potential to be an essential element in the conduct of war —regardless of its use in military weaponry—, since war is always led by the military high command, which today needs powerful tools to predict and manage conflicts in order to achieve positive results against enemies who are also beginning to use these new AI-based systems. This paper is a preliminary analysis that may be followed in the future by more in-depth scientific work, including, if appropriated, the participation of Proxima Alpha with its unique War Mind® AI geopolitical system; since, as demonstrated in the description of the two cases shown above, the potential of new AI systems can profoundly transform the mathematical capabilities of current equation-based combat systems, thereby offering new possibilities to the high command in the conduct of warfare.

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