UDC 327::004.896
DOI: 10.5937/spm98-67084
Original research article

Српска политичка мисао
(Serbian Political Thought)
No 4/2026.
Vol. 98
pp. 147-169

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QUANTIFICATION OF GEOPOLITICAL FACTORS VIA ARTIFICIAL INTELLIGENCE

Abstract

The contemporary security environment, characterized by extreme volatility and a structural transition towards a multipolar geopolitical paradigm, has exposed the severe analytical and operational limitations of traditional bureaucratic models of strategic planning. The subject of this paper is a theoretical and methodological analysis of the possibilities for integrating artificial intelligence systems into the process of continuous security risk assessment. The research goal is to present the conceptual architecture of the ARES model (AI-Driven Risk & Environment Strategy) as an innovative instrument that enables the quantification of geopolitical, geoeconomic, and demographic factors into measurable algorithmic inputs. By applying Markov Decision Processes and deep

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learning algorithms, the ARES model enables advanced simulations (AI wargaming) that filter out bureaucratic biases. Through the application of modeling, analysis, and synthesis methods, the paper indicates that the implementation of predictive analytics within the state apparatus is sustainable only through the normative synergy of the ISO 31000 and ISO/IEC 42001 standards. The results show that the intersection of classical geopolitical methodology and predictive analytics (AI wargaming) substantially shortens the state's reaction time to hybrid threats. It is concluded that the algorithmization of risk assessment does not abolish doctrinal sovereignty but rather strengthens it, with the mandatory condition of retaining the Human-in-the-Loop mechanism in strategic decision-making.

Keywords: artificial intelligence, geopolitics, ARES model, national security, predictive analytics, multipolarity, hyperwar, asymmetric deterrence

INTRODUCTION

The contemporary security environment requires a radical redefinition of state planning instruments. The problem of contemporary strategic planning lies in the fact that in the current VUCA[1] environment (volatility, uncertainty, complexity, and ambiguity), the speed of generating change exponentially surpasses the analytical and operational capacities of the traditional bureaucratic apparatus. With the entry into the era of artificial intelligence (AI), the nature of strategy is changing irreversibly. As Henry Kissinger warns, algorithms perceive reality and process variables with a speed and scope that surpass human cognition, thus states that do not integrate these capacities risk strategic paralysis (Kissinger, Schmidt and Huttenlocher 2021).

However, although artificial intelligence is unequivocally positioned as a key tool for accelerating the strategic decision-making process, it is necessary to point out one doctrinal fact: algorithms are essentially "blind" if they are not fed with adequate geopolitical

[1] The term VUCA itself was first used by the US Army War College to describe the chaotic post-Cold War world. VUCA is an acronym for: Volatility, Uncertainty, Complexity, and Ambiguity.

parameters. Starting from the postulates of the contemporary geopolitical school and Professor Milomir Stepić, space, resources, and demographics remain inexorable constants of power. Thus, an algorithm that has not integrated these key geopolitical indicators does not generate a prediction, but rather a technological illusion. Precisely in bridging this gap, between geopolitical reality and algorithmic speed, lies the need for developing new theoretical and practical instruments.

The primary research question this paper answers is: In what way can classical geopolitical, geoeconomic, and demographic factors be algorithmically quantified and integrated into artificial intelligence systems for the purpose of continuous and accelerated risk assessment? Accordingly, the subject and goal of this paper is to present the conceptual architecture of the AI-Driven Risk & Environment Strategy model (ARES) through the integration of contemporary geopolitical methodology, thereby offering the national security system an innovative instrument for predictive adaptation.

In accordance with the defined problem and objectives, the central hypothesis of the paper assumes that the intersection of classical geopolitical methodology and predictive analytics tools (AI wargaming) through the ARES model substantially shortens the state's reaction time to hybrid threats. This hypothesis is supplemented by a derived assumption claiming that the algorithmization of risk assessment is sustainable exclusively through the normative synergy of international standards (International Organization for Standardization [ISO] 2018; ISO 2023), with the mandatory retention of the Human-in-the-Loop mechanism to preserve state sovereignty.

To achieve the research objectives and test the hypotheses, an appropriate methodology has been applied in the paper. The basic research relies on the hypothetical-deductive method. Modeling was used for the conceptualization and development of the system architecture, while content analysis and synthesis methods were applied in the theoretical part of the paper, primarily in the study of relevant geopolitical literature and current ISO standards in the fields of risk management and high technologies.

The structure of the paper directly follows the logic of the presented methodological framework. The first chapter analyzes the geopolitical paradigm of multipolarity and defines key indicators (space, resources, demographics) according to contemporary geopolitical theory.

The second chapter presents the architecture of the ARES model itself and explains the normative framework necessary for its implementation. The third chapter provides the central synthesis of the paper, explaining the mechanism of quantification of spatial inputs in algorithmic simulations. The fourth chapter elaborates on the doctrinal control of the system through the Human-in-the-Loop mechanism, followed by a conclusion that sublimates the main findings and offers guidelines for further research.

THE GEOPOLITICAL PARADIGM OF MULTIPOLARITY AS A BASIS FOR THREAT ASSESSMENT

The crisis of traditional strategic planning is a direct consequence of an inadequate perception of the contemporary international order. Instead of the previous monopolar structure, contemporary international relations are in an accelerated process of transition towards multipolarity. Although a multipolar order is not yet fully shaped, the certainty of its arrival already dictates a new geopolitical reality. In this transition phase, alongside the individually strongest United States and the European Union as a whole, China and Russia are taking on an increasingly significant role, while states like India, Japan, and Brazil are also aspiring to the status of serious powers (Despotović i Glišin 2021, 90–97).

Such a transition from a unipolar system does not represent just a mere change in the number of great powers, but a fundamental structural break that generates an exponential growth of instability and uncertainty. John Mearsheimer, one of the leading theorists of offensive realism, convincingly proves that multipolar systems are inherently more prone to conflict compared to bipolar or unipolar orders. The reason for this lies in the fact that a larger number of actors in the struggle for supremacy dramatically increases the possibility of misperceiving others' intentions and capacities (Mearsheimer 2001). In an environment characterized by the return of relentless great power rivalry, national security strategy can no longer rely solely on descriptive political assessments or outdated liberal doctrines from the "end of history" era (Fukuyama 1992), but must be grounded in a strict geopolitical methodology.

Although dizzying technological development at the end of the 20th century created an illusion that geographic space had been overcome, contemporary theory sharply refutes such a stance. Robert D. Kaplan, in his capital work *The Revenge of Geography*, warns that physical geography, relief, climate, and demographics remain permanent determinants of the fate of states, and that international crises cannot be properly understood without returning to the map and spatial laws (Kaplan 2012). Similarly, prominent British strategist Colin S. Gray notes that strategy must always be "anchored" in space, because physical reality limits or enables the projection of state power (Gray 1999). In conditions of a certain transition to a multipolar order, geopolitics has not been suppressed under the pressure of globalization; it has become more complex and dangerous. Classical territorial struggle has evolved into competition for control of critical geoeconomic corridors, technological hubs, and energy resources. This view directly corresponds to the theses of Zbigniew Brzezinski, who defines geopolitical space precisely through the necessity of controlling key geostrategic points on the global chessboard (Brzezinski 1997). Additionally, as Joseph Nye points out, the nature of power is undergoing a transformation in the information age, where technological superiority and network control become equally important existential factors as classical military force (Nye 2011).

The structural break brought about by the transition to multipolarity cannot be fully understood without reference to Kenneth Waltz's theory of neorealism. In his seminal work *Theory of International Politics*, Waltz postulates that the international system is anarchic by nature, and that the system's structure itself – specifically the distribution of power among actors – relentlessly dictates the behavior of states whose primary goal is solely survival (Waltz 1979). Analyzing the stability of various orders, Waltz proves with mathematical precision that multipolar systems are inherently more unstable than bipolar ones. In a configuration with more than two great powers, the flexibility of alliances paradoxically leads to the rigidity of strategies. States are constantly exposed to the risk of fatal errors in assessing the intentions of opponents and the reliability of partners. It is precisely this Waltzian "structural uncertainty" of the emerging multipolarity that represents the environment in which traditional, linear models of risk assessment collapse.

This anarchic structure is particularly merciless toward small states. Great powers, acting as active geostrategy players, possess the luxury of so-called strategic depth. Their massive spatial, economic, and demographic weight allows them to absorb the consequences of incorrect geopolitical assessments and survive the first blow. In contrast, small states are most often found in the role of geopolitical pivots, whose delicate position arises exclusively from a sensitive geographical location that makes them objects of constant competition between great powers (Despotović i Glišin 2021, 165–166). As such, states of lesser demographic and spatial weight do not possess a margin for strategic error. Their survival in the emerging multipolar chaos directly depends on the ability for timely balancing, precise hedging (strategic insurance), and escalatory control. This thesis is confirmed by Barry Posen, whose research on state strategies in a multipolar system proves that smaller actors must develop superior mechanisms for threat prediction to compensate for the lack of strategic depth (Posen 2009). Hence, the introduction of predictive analytics systems into the state apparatus of small countries is not a mere matter of technological prestige, but a supreme existential imperative. They must compensate for their obvious lack of so-called hard power with superior decision-making speed, which can only be achieved through the algorithmization of risk assessment.

Relying on such a global theoretical framework, it is necessary to view contemporary security challenges through the prism of relevant domestic scientific thought. As Professor Milomir Stepić explains in his study, *Geopolitics: Ideas, Theories, Conceptions*, geopolitical methodology requires a synthetic examination of the interdependence of spatial, demographic, resource, and economic factors (Stepić 2016). These factors are not abstract categories but inexorable constants that determine national power and a state's capacity for survival in an environment of emerging multipolarity. This transitional phase is no longer just a theoretical perspective of transition, but a processual geopolitical reality that definitively shapes the modern world. To properly perceive this complex, contemporary geopolitics must be applied as a synthesis science that requires an eclectic approach, combining realistic observation and abstract thinking. Such a geopolitical method requires decision-makers to possess skills (*techne*), knowledge (*episteme*), and practical wisdom (*phronesis*) in the purposeful consideration of state interests (Glišin 2024, 84–87; Despotović i Glišin 2021). In this context, Stepić's methodological approach indicates that the degree of threat to a state can only be assessed through a multidimensional intersection of the aforementioned factors. For example, a bare physical-geographical position (space) gains its real security valence only when intersected with demographic trends, infrastructural capacities, and access to vital resources. More precisely, according to contemporary geopolitical systematization, the actual status of a state is determined through a dynamic correlation of six key criteria: 1) geographical position in relation to relief and resources, 2) characteristics of the regional environment, 3) the network of transport corridors, 4) internal-political structure, 5) foreign-policy conduct, and 6) military-strategic position (Glišin 2024, 88). The final interaction of these parameters defines the geopolitical fate of a state, placing it in one of four types of geopolitical positions: buffer, frontier, surrounded position, or the most sensitive – island position (Glišin 2024, 89). This multidimensionality creates an extremely complex matrix of variables that are constantly transforming.

What further complicates the emerging multipolarity is the speed at which these variables intersect and mutate, creating a deeply non-linear environment. Nassim Nicholas Taleb, a risk theorist and author of the "Black Swan" concept, proves that such complex systems are extremely fragile and susceptible to rare, unpredictable events with extreme consequences (Taleb 2010). Traditional risk assessment mechanisms within the state apparatus are based on linear extrapolation of the past, which makes them completely blind to the "black swans" of contemporary geopolitics. In conditions where a single geoeconomic sanction, a sudden disruption of the supply chain, or the use of asymmetric weapons (such as drone swarms) can change the regional balance of power within a matter of hours, existing decision-making models become dangerously slow (Đorić i Glišin 2023; Glišin and Milašinović 2025).

The main institutional problem lies precisely in this methodological complexity and speed of change. Michael C. Horowitz analyzes this vulnerability in detail in his studies on the diffusion of military power, proving that the mere possession of technology is insufficient if the state apparatus does not possess the organizational ability to integrate it into a rapid decision-making process (Horowitz 2010). The traditional bureaucratic apparatus clearly lacks the analytical and operational capacity necessary to timely process thousands of intersecting geopolitical indicators. A human analyst, burdened by cognitive biases and biologically limited data processing power, is capable of recognizing a general political trend but cannot calculate all its exponential consequences in real-time. This is particularly evident when those consequences are obscured by the ambiguity of moves made by other international actors.

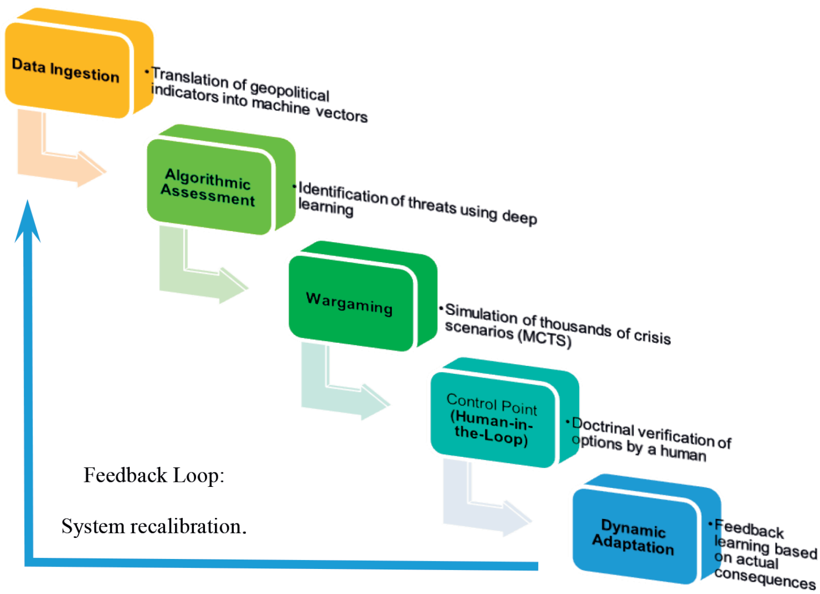
In order for classical geopolitical methodology, from Mearsheimer and Kaplan to Stepić, to achieve its full potential in the contemporary security environment, its key factors must be translated from qualitative descriptions into quantitative values. Space, resources, and demographics must become measurable indicators, converted into machine-readable inputs. Only such quantification enables the overcoming of the previously mentioned human limitations and creates a secure basis for algorithmic risk assessment. It is precisely this quantification that, through the development of the ARES model, will ensure strategic adaptability and continuity of decision-making in the era of hyper-information confrontation.

ARCHITECTURE OF THE ARES MODEL IN THE NATIONAL SECURITY SYSTEM

In order to translate the exponential complexity of the geopolitical environment into an operational system capable of predictive action, it is necessary to develop a specific algorithmic framework. In response to this requirement, the conceptual architecture of the ARES model (AI-Driven Risk & Environment Strategy) was created. This model represents a synthesis of advanced machine learning methods and classical strategic analysis, designed with the aim of eliminating the reactive delay of the state apparatus.

Viewed through the prism of military theory, the ARES model essentially represents an algorithmic accelerator of the OODA loop (Observe, Orient, Decide, Act). As postulated by military strategist John Boyd, victory in complex conflicts is won by the side that completes this cognitive cycle faster, forcing the opponent to react to already outdated information (Boyd 1986).

Graph 1. Phases of the operational architecture of the ARES model



Source: Author.

The basic architecture of the ARES model unfolds through five successive and interdependent phases:

1. Data Ingestion: Continuous collection and structuring of multimodal data. In this phase, geopolitical indicators (space, resources, demographics) are translated into machine-readable vectors.
2. Algorithmic Assessment: Application of deep learning for pattern recognition in collected data, thereby identifying anomalies that indicate early stages of hybrid or conventional threats.
3. Wargaming (Algorithmic War Games): A phase in which the system uses reinforcement learning (Reinforcement Learning) to generate thousands of simulated crisis scenarios. Relying on the achievements postulated in this field by Richard Sutton and Andrew Barto (Sutton and Barto 2018), the system analyzes millions of potential moves to find the optimal strategic option.
4. Human-in-the-Loop (HITL): A key control point where decision–makers (military and political leadership) verify algorithmically

offered options, thereby maintaining a doctrinal monopoly over the use of state power.

5. Dynamic Adaptation: A feedback learning phase where the system, based on the decision made and its actual consequences on the ground, recalibrates its future assessments.

The implementation of such an advanced system into the state apparatus cannot take place in a legal and ethical vacuum. Experts in autonomous systems, such as Paul Scharre, warn that unlimited reliance on autonomous algorithms in national security can lead to undesired escalation of conflict, namely, entering an uncontrolled "hyperwar" (Scharre 2018). Therefore, the ARES model must rest on a strict normative framework consisting of international standards. The ISO 31000 standard provides an umbrella methodology for risk management, defining principles that ensure the assessment is transparent and integral (ISO 2018). On the other hand, the application of the ISO/IEC 42001 standard (Information technology – Artificial intelligence – Management system) guarantees that the algorithms used in the ARES model are subject to review, ethically aligned, and protected from external manipulations (ISO 2023). This normative synergy ensures that technology remains a secure instrument of the state.

The key value of implementing predictive analytics and machine learning through the described architecture is reflected in overcoming human cognitive biases, which represent the main cause of fatal delays in strategic decision-making. This problem directly leans on the concept of "bounded rationality" (Bounded Rationality) founded by Nobel laureate Herbert Simon (Herbert Simon). Simon proves that decision-makers in administrative systems, faced with too much information and limited time, do not have the capacity to make optimal, but only "satisficing" decisions (Simon 1957). Building on that, Daniel Kahneman (Daniel Kahneman), a Nobel Prize winner and leading world authority on the psychology of decision-making, proved that the human mind under pressure of stress and uncertainty instinctively resorts to heuristics – simplified patterns of reasoning that lead to systemic errors (Kahneman 2011). A deeper analysis of these cognitive limitations within traditional bureaucratic structures reveals a fundamental weakness of the state apparatus in crisis situations. As Irving Janis (Irving Janis) proved in his classic study, crisis staffs and political leaderships are extremely susceptible to the phenomenon of "groupthink" (Groupthink), a psychological mechanism where the pursuit of internal consensus and loyalty overrides a critical analysis of alternative and unpopular options (Janis 1982). In high-stress VUCA conditions, military and political leaders instinctively reject information that does not fit into existing, often outdated doctrinal frameworks. Additionally, according to the bureaucratic model of decision-making developed by Graham Allison, state strategies rarely represent the product of pure rational choice; they are most often the result of inertia, compromise, and rivalry between different security agencies and ministries (Allison 1971). This institutional inertia and cognitive blindness represent a fatal threat to national security, as they prevent the timely recognition of hybrid threats that do not fit into the patterns of past wars.

It is precisely in neutralizing this human factor that the "Algorithmic Assessment" phase within the ARES model demonstrates its critical doctrinal value. By utilizing deep neural network architectures (Deep Learning), the system mathematically filters out bureaucratic noise. Unlike a human, an algorithm does not suffer from the need for consensus, is not subject to the authority of rank or position, and lacks career-driven motives to ignore politically inconvenient data. Its task is solely the cold identification of hidden patterns and geopolitical anomalies. In this way, the ARES model functions as a relentlessly objective "devil's advocate" within the strategic planning room. It compels decision-makers to step out of their comfort zones and confront exact mathematical probabilities, rather than relying on conventional bureaucratic wisdom that, in a multipolar world, guarantees strategic defeat.

In geopolitical crises, leaders and analysts often suffer from "confirmation bias" (seeking information that validates pre-existing beliefs) and an inability to intuitively comprehend the exponential growth of threats. Philip Tetlock, whose decades of research on geopolitical forecasting set new benchmarks for the intelligence community, points out that algorithms dramatically outperform human experts, specifically in their ability to synthesize vast numbers of heterogeneous variables without emotional attachment to prior assessments (Tetlock and Gardner 2015). By eliminating these biological cognitive barriers, the ARES model allows decision-makers to perceive crises with mathematical objectivity and react proactively, converting algorithmic speed into a decisive strategic advantage.

INTEGRATION OF GEOPOLITICAL METHODOLOGY INTO AI WARGAMING INPUTS

The greatest epistemological challenge in applying artificial intelligence within political and security sciences lies in the necessity of quantifying qualitative phenomena. While traditional geopolitical assessments are often narrative and descriptive in nature, machine learning algorithms require strict mathematical values. Hence, the central scientific contribution of the ARES model lies precisely in the "Data Ingestion" phase, which represents a methodological bridge between classical geopolitical theory and contemporary computational logic.

In order to translate Stepić's paradigm of space, resources, and demographics into a language that a computer understands, these factors must be ontologically restructured. Judea Pearl, a Turing Award winner and a leading world authority on causal reasoning in artificial intelligence, proves that complex social relations can be algorithmically processed only if they are converted into precise causal models and Bayesian networks (Pearl 1988). Accordingly, the ARES model does not read geopolitical analyses as text but deconstructs them into multidimensional mathematical tensors. In the ingestion phase, geopolitical space is no longer viewed as a static map, but as a dynamic network of nodes and edges, where every geographical, demographic, or economic element receives its numerical weight based on its current strategic value within the multipolar system.

The operationalization of this concept within the ARES model relies on a mathematical framework known as the Markov Decision Process (MDP). As Stuart Russell and Peter Norvig state in their seminal work on artificial intelligence, an MDP represents a standard mathematical model for decision-making scenarios where the decision-maker consciously executes actions within their control, while the ultimate outcomes remain subject to the inherent unpredictability and probabilistic dynamics of the environment (Russell and Norvig 2021, 552–554). In the context of national security, the current geopolitical situation represents the "State" (S), while the diplomatic, economic, or military moves of the state are "Actions" (A). Translating Stepić's factors into MDP inputs in practice looks like this:

1. Demographic Factors: Demographic decline is described in traditional analysis as a long-term risk. However, in the ARES model, demographics become a dynamic vector that continuously

updates data on age structure, fertility rates, and migration balance. If the system detects a decline in the conscription contingent below a critical level, the algorithm quantifies this as an exponential drop in defensive power (a *reward penalty* in the MDP), which directly affects simulations of future conventional conflicts, signaling to state leadership that the strategic focus must shift from a mass army to autonomous systems.

2. Energy Hubs and Resource Routes: Control over energy resources is quantified through graph theory. Pipelines, ports, and strategic straits are assigned values as "critical nodes." If a geoeconomic crisis blocks a certain supply route, the system instantly recalculates the consequences of that blockade on the national economy and military combat readiness.
3. Geoeconomic Sanctions: Instead of political speculation about the consequences of sanctions, they are entered into the algorithm as mathematical "friction variables." Sanctions alter the "Transition Probability Matrix," limiting the set of available state actions and forcing the algorithm to seek new, asymmetric paths to achieve strategic goals.

The operationalization of the ARES model through Markov processes gains its full security and strategic weight only when geopolitical inputs are intersected with the phenomena of contemporary technological confrontation, primarily in the context of so-called hyperwar and the application of autonomous drone swarms. As defined by US General John Allen and Amir Husain, hyperwar represents a new type of conflict in which human reaction time is almost entirely eliminated from the tactical decision-making chain, as algorithms analyze targets and execute strikes in microseconds (Allen and Husain 2017). In such an extreme environment, traditional, cumbersome, and expensive military platforms – such as conventional armored divisions or massive air defense systems – become extremely vulnerable to massed, cheap, and networked drone swarms (Swarm Intelligence) centrally managed by artificial intelligence. P. W. Singer elaborates on this paradigm in detail, pointing out that the introduction of autonomous robotics to the battlefield fundamentally changes the character of war, making expensive, centralized conventional systems obsolete in the face of distributed algorithmic threats (Singer 2009).

By integrating these parameters, the ARES model does not function exclusively as an early warning system but becomes a supreme instrument of asymmetric deterrence, which is of existential importance for the strategic positioning of small states. Instead of a small state attempting to match great powers in the quantity of conventional weaponry – which is spatially and demographically impossible – the system uses algorithmic simulations to find points of cognitive and tactical superiority. This approach directly draws on the concepts of David Kilcullen, who proves that smaller state actors can and must use commercial, readily available technologies (such as drone swarms) to develop effective asymmetric methods of countering the traditional military power of great powers (Kilcullen 2020).

The ARES algorithm simulates the interaction between an attacking conventional formation and a defensive autonomous swarm, generating thousands of scenarios in which a spatially inferior but technologically networked side can inflict mathematically unacceptable damage on an aggressor. If the model proves through wargaming that the speed of an autonomous response lowers the probability of an opponent's success below a critical threshold, the state achieves a deterrent effect not through brutal military mass, but through superior algorithmic decision-making speed and the projection of asymmetric risk. As General Mick Ryan observes, in modern competition, a state's ability to achieve a "cognitive edge" through the integration of humans and machines becomes the primary factor of deterrence, surpassing mere physical mass of troops (Ryan 2022). Through this mechanism, artificial intelligence ceases to be just an analytical tool and becomes an equal element of national power, capable of neutralizing deficiencies in traditional geopolitical constants.

The crown of this methodological synthesis is reflected in the ability of the ARES model to conduct advanced AI wargaming simulations in real-time. When quantified geopolitical data are entered into the system, the model uses reinforcement learning algorithms and Monte Carlo Tree Search (MCTS). This same architecture was used by the DeepMind team (Silver *et al*. 2016) when creating the AlphaGo system that defeated a human world champion. Although geopolitics is incomparably more complex than a board game, the essential logic of the algorithm remains the same: the computer does not analyze only the current state, but plays out millions of potential "What-If" scenarios (war games) in advance, exploring all possible moves of the opponent and its own responses to them.

In such an environment, classical conflict theories receive their final technological confirmation. Thomas Schelling, a Nobel laureate and pioneer of game theory in nuclear strategy, postulated that conflicts are won not only by force but by superior calculation of the opponent's intentions and options (Schelling 1980). The ARES model does exactly that; it simulates thousands of iterations of hybrid attacks, economic pressures, or military provocations, calculating the probability of success for each individual countermeasure.

The final advantage of such a synthesis is immeasurable: while a human crisis staff in high-stress and VUCA environments needs days to develop three to four realistic scenarios, the ARES model offers decision-makers a mathematically verified map of optimal strategic options within a few hours. The system thus does not make the final political decision but enables the leader to base their decision on an exact, algorithmically proven prediction, thereby reducing strategic surprise to an absolute minimum.

THE ROLE OF HUMANS IN THE AGE OF ALGORITHMS

Although the implementation of artificial intelligence systems dramatically accelerates the processes of risk assessment and the generation of strategic options, there is a fundamental danger in equating algorithmic superiority with political wisdom. Technological determinism, which advocates for the full autonomy of machines in the national security system, neglects the basic nature of conflicts. Drawing on the timeless thought of Carl von Clausewitz, war and strategy are not isolated mathematical phenomena but represent the continuation of state policy by other means (Klauzevic 1951). This Clausewitzian paradigm in the context of autonomous systems is actualized by Kenneth Payne, who proves that while algorithms fundamentally change the tactical dynamics of the battlefield, the political and psychological character of conflict itself remains deeply rooted in human nature (Payne 2021). An algorithm, no matter how sophisticated, does not possess the capacity to understand political context, empathy for human losses, or moral responsibility for shed blood. Therefore, leaving the final decision to a machine does not represent technological progress but an abdication of state sovereignty.

In the architecture of the ARES model, this challenge is addressed through the strict application of the Human-in-the-Loop (HITL) concept. This doctrinal mechanism requires artificial intelligence to perform the role of a cognitive partner (the so-called centaur model), while humans retain the role of the supreme strategic arbiter. The "centaur model" concept is further elaborated by General Mick Ryan, emphasizing that the modern national security architecture must rest on hybrid teams (Human-Machine Teaming), where the machine generates assessments at a speed inaccessible to humans, while humans retain the exclusive right to make contextual and value-based judgments (Ryan 2022). This is supported by Christian Brose, one of the leading American strategists for integrating new technologies into defense systems, who, in his study *The Kill Chain*, explains in detail that the goal of artificial intelligence is not to remove humans from the "decision-making chain," but to free them from micro-analytics so that they can make macro-strategic decisions in microseconds (Brose 2020). The machine processes geopolitical data, predicts opponent moves, and offers optimal vectors of action, but the human operator – meaning the state leadership – must authorize the execution of the action.

Retaining human control is not only an ethical issue but a supreme security imperative, especially in the context of the survival strategy of smaller states in a complex multipolar world. For states of lesser demographic and spatial weight, which rely on hedging (strategic insurance) and balancing strategies within the intensified rivalry of great powers, there is no room for systemic error. If a fully autonomous system were to misinterpret an ambiguous move by an opponent and initiate escalation (a phenomenon known as a Flash War), the consequences for a small state would be existential. The human in the loop (HITL) represents that key safety mechanism capable of recognizing a bluff, a political nuance, or a psychological game that algorithms trained on historical data cannot detect.

Furthermore, the role of humans is essential for solving the "Value Alignment" problem. Stuart Russell, one of the pioneers of artificial intelligence, warns that machines relentlessly optimize the objective functions assigned to them, which can lead to catastrophic outcomes if those functions are not perfectly aligned with human intentions and international law (Russell 2019). For example, an algorithm tasked with neutralizing a security threat at any cost might suggest an option that violates proportionality or the norms of humanitarian law.

Precisely for this reason, the normative framework discussed in the second chapter – primarily the ISO/IEC 42001 standard – insists on clear accountability. The ARES model quantifies risks and illuminates the "fog of war," but responsibility for the nation's destiny remains inalienably tied to the political and military leadership. By integrating the HITL mechanism, the state achieves strategic adaptability and algorithmic reaction speed while retaining its moral vertical and the sovereign right to manage its own survival.

CONCLUSION

The contemporary transition of the international order toward a multipolar paradigm has definitively nullified linear forecasting models and returned geopolitics to the very center of national security. In an environment characterized by the exponential growth of volatility, the speed of change on the global chessboard surpasses the analytical and operational capacities of the traditional bureaucratic apparatus. The research conducted in this paper has shown that this institutional gap cannot be bridged merely by increasing human resources; rather, it requires radical technological and methodological innovation within the strategic planning system.

The central scientific contribution of this paper is reflected in the development of the conceptual architecture of the ARES model, which represents a theoretical and practical bridge between classical geopolitical thought and advanced machine learning algorithms. It has been proven that artificial intelligence algorithms, if operating in a strategic vacuum, cannot provide a realistic threat assessment. However, through the algorithmic ingestion phase, the ARES model successfully translates qualitative geopolitical indicators – physical space, demographic trends, and geoeconomic resources – into mathematically measurable vectors. This quantification enables computational systems to predict hundreds of possible crisis scenarios through Markov Decision Processes and real-time AI wargaming simulations, offering state leadership mathematically verified options for action.

By this, the central hypothesis of the paper is fully confirmed: the intersection of Stepić's geopolitical methodology and predictive analytics tools fundamentally shortens a state's reaction time to hybrid threats, eliminating cognitive biases that lead to fatal delays in decision-making. The speed of algorithmic data processing becomes a crucial component of deterrence, especially in the context of delicately positioned states whose spatial and demographic capacities are limited. In conditions of relentless great-power rivalry, smaller actors do not have the luxury of strategic error; their survival directly depends on the ability to anticipate a crisis before it escalates into open conflict.

At the same time, the derivative hypothesis regarding the doctrinal control of such systems has also been confirmed. The implementation of artificial intelligence into the national security system is sustainable only if carried out through strict normative synergy with the international standards ISO 31000 (ISO 2018) and ISO/IEC 42001 (ISO 2023). The ARES model does not advocate for technological determinism or the creation of fully autonomous weapon systems. On the contrary, through the Human-in-the-Loop (HITL) mechanism, it reaffirms the Clausewitzian principle of the primacy of politics over war. Artificial intelligence takes on the burden of massive data processing and risk projection, but the monopoly over the final decision, as well as the moral and legal responsibility for it, remains the inalienable right of the human, namely, the state leadership.

This conceptual paper sets a solid theoretical foundation for the modernization of strategic planning. Future research in this field must be directed toward the empirical validation of the ARES model through case studies and computer simulations of specific hypothetical crises in Southeast Europe. Only through continuous testing of algorithmic outputs against real-world geopolitical events can the state apparatus build trust in predictive analytics and permanently ensure its strategic adaptability in the age of artificial intelligence.

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КВАНТИФИКАЦИЈА ГЕОПОЛИТИЧКИХ ФАКТОРА ПУТЕМ ВЕШТАЧКЕ ИНТЕЛИГЕНЦИЈЕ

Резиме

Савремена епоха, дефинисана као VUCA окружење (волатилност, неизвесност, сложеност и амбигуитет), захтева радикално редефинисање традиционалних модела стратешког планирања. Овај рад анализира еволуцију геополитичке методологије кроз призму интеграције вештачке интелигенције, са посебним фокусом на развој и концептуализацију ARES модела (*AI-Driven Risk & Environment Strategy*). Централни проблем истраживања јесте превазилажење институционалног раскорака између наративне природе геополитике и квантитативних захтева савремених алгоритама. Кључни резултати истраживања указују на то да је фаза „ингестије података" методолошки мост који омогућава квантификацију квалитативних фактора, као што су демографија, ресурси и географски простор. Коришћењем Марковљевих процеса одлучивања (MDP), ARES модел трансформише статичне мапе у динамичне мреже тензора, омогућавајући рачунарском систему да симулира хиљаде „What-If" сценарија у реалном времену. Посебан значај модела огледа се у његовој примени унутар концепта „хиперрата" (*Hyperwar*), где брзина алгоритамског одлучивања и примена аутономних ројева дронова постају примарни инструменти асиметричног одвраћања за државе са ограниченим просторним и демографским капацитетима. Закључак рада наглашава да вештачка интелигенција не представља замену за човека, већ супериоран аналитички алат. Кроз имплементацију механизма *Human-in-the-*

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Loop (HITL) и придржавање стандарда ISO/IEC 42001, ARES модел осигурава да коначна стратешка одлука остане суверено право људског фактора. На тај начин, држава остварује „когнитивну надмоћ" и стратешку адаптабилност, чиме се ризик од стратешког изненађења у мултиполарном поретку своди на минимум.

Кључне речи: вештачка интелигенција, геополитика, ARES модел, национална безбедност, предиктивна аналитика, мултиполарност, хиперрат, асиметрично одвраћање

[*] This manuscript was submitted on May 8, 2026, and accepted by the Editorial Board for online publication and published *online first* on June 5, 2026. It was accepted by the Editorial Board for publishing on August 10, 2026.