Metaversalize

www.meta.reapress.com

Metaverse. Vol. 3, No. 1 (2026) 12–21.

Paper Type: Original Article

Simulating the Future of Warfare: Artificial Intelligence Applications, Opportunities, and Challenges in Military Training

Mohammad Reza Khosravi[1,*], Amir Hoshang Sabzevari[1], Ali Karimi[1], Yaser Roozbahani[1]

[1] Department of Defense Management, Imam Ali Military University, Tehran, Iran; mohammadreza.5605875@gmail.com; amirhoshang.4200611041@gmail.com; Alikarimi13811381aa@gmail.com; Yaser.r1383.1@gmail.com.

Citation:

Received: 11 May 2025 *Revised: 04 August 2025* *Accepted: 25 October 2025*	Khosravi, M. R., Sabzevari, A. H., Karimi, A., & Roozbahani, Y. (2026). Simulating the future of warfare: Artificial intelligence applications, opportunities, and challenges in military training. *Metaversalize*, *3*(1), 12-21.

Abstract

Traditional military training methods face persistent challenges, including high costs, physical safety risks inherent to live field exercises, and an inability to replicate the full complexity and dynamism of contemporary combat environments. These constraints reduce the operational readiness of military forces and limit their capacity to adapt to rapidly evolving threats. Artificial Intelligence (AI) offers promising solutions to these limitations through advanced simulation, adaptive learning, and data-driven decision support. This review study investigates the applications of AI in military simulation and training, with the goals of reducing training costs, increasing simulation realism, enhancing military decision-making under pressure, and identifying opportunities and barriers to AI adoption. Using a structured qualitative review methodology, the study analyzes AI-based technologies, including Virtual Reality (VR), Augmented Reality (AR), deep learning, and reinforcement learning algorithms, applied across a range of military training contexts. Evaluation dimensions encompass decision-making speed, threat-response accuracy, and reduction of human error. Findings indicate that AI significantly improves training efficiency, realism, and safety, while challenges related to cost, cybersecurity, and organizational resistance remain. The study concludes with recommendations for localized frameworks and future research priorities, with particular relevance for resource-constrained defense organizations.

Keywords: Artificial intelligence, Military training, Virtual and augmented reality.

1 | Introduction

The rapid advancement of military technologies and the increasing complexity of modern threats have made the evolution of military training and simulation methods not merely advantageous but essential.

Corresponding Author: mohammadreza.5605875@gmail.com

https://doi.org/10.22105/metaverse.v3i1.97

Conventional approaches to military training, including live field exercises, physical maneuvers, and the deployment of real equipment, are frequently constrained by high operational costs, risks to personnel safety, time inefficiencies, and an inherent inability to recreate the full spectrum of dynamic battlefield variables [1–3]. Simulating a large-scale military operation using conventional assets may consume tens of millions of dollars while still failing to account for the unpredictability of real combat environments [4].

Artificial Intelligence (AI), with its capacities for large-scale data processing, adaptive learning, and the generation of realistic simulated environments, presents a compelling framework for overcoming these structural limitations. AI-based simulation systems can reconstruct complex operational scenarios, including cyberattacks, asymmetric warfare, and urban combat, with a level of fidelity unattainable through traditional means [5], [6]. Furthermore, by analyzing data from historical exercises and operations, AI can reveal enemy behavioral patterns, expose strategic vulnerabilities, and suggest optimized tactical responses. These capabilities are particularly significant for resource-constrained defense organizations seeking to maximize operational readiness within limited budgets [7].

Despite these advantages, substantial barriers to AI adoption persist in military contexts. Inadequate technological infrastructure, a shortage of qualified specialists, difficulties in integrating AI systems with legacy military platforms, and concerns over data security represent significant obstacles [8], [9]. This study examines these challenges systematically and proposes structured approaches for the effective integration of AI into military training and simulation programs.

The remainder of this paper is structured as follows. Section 2 presents a review of the relevant literature on AI applications in military contexts. Section 3 outlines the research objectives. Section 4 describes the methodology, including the structured review approach, source selection criteria, and data analysis procedures. Section 5 reports the findings, organized around AI applications, adoption opportunities, implementation challenges, and identified research gaps. Section 6 offers a discussion of the findings in relation to the broader literature. Section 7 presents the conclusion, followed by practical recommendations and a complete reference list.

2 | Literature Review

Research on AI applications in military contexts has accelerated substantially over the past two decades, driven largely by investments in advanced defense organizations. In the United States, the Defense Advanced Research Projects Agency (DARPA) synthetic training environment initiative employs AI and Virtual Reality (VR) to create comprehensive, integrated training environments that enable soldiers to develop tactical and strategic competencies in simulated scenarios [10]. These developments illustrate the growing role of AI in military training, simulation, and decision-support systems for complex operational environments.

The use of AI-based models for enemy behavior prediction and tactical decision simulation has been documented across numerous studies. The study examined the strategic implications of autonomous weapons systems and highlights the importance of simulation-based training for preparing forces to operate alongside AI-enabled platforms. Kania [11] provided an analysis of China's strategic approach to AI in defense, emphasizing investments in intelligent training systems and autonomous decision-support tools [12]. They explored the broader strategic landscape of AI-enabled warfare, arguing that simulation environments will be decisive in preparing forces for future conflicts.

Notwithstanding this body of work, the literature reveals significant gaps, particularly with respect to developing and transitioning nations. Many existing frameworks presuppose advanced computing infrastructure, robust indigenous data resources, and large pools of AI-specialized personnel, conditions that are frequently absent outside the most technologically advanced militaries. This study contributes to filling that gap by examining both the opportunities and constraints associated with AI adoption in defense training contexts where resources are more limited.

The existing literature reveals several significant research gaps that constrain the optimum exploitation of AI in military training:

I. The majority of published research focuses on AI applications in technologically advanced defense organizations. Developing and adapting AI solutions for organizations with limited computing infrastructure, constrained budgets, or restricted access to specialized personnel remains underexplored. The lack of indigenous research increases dependence on foreign systems, with associated cost and security implications.

II. Most published studies examine short-term training outcomes. The long-term effects of AI-based training, including the persistence of acquired skills, the psychological impacts of extended immersive simulation exposure, and the risk of system dependency, remain poorly understood. Longitudinal experimental designs are needed to address these questions.

III. The absence of internationally accepted standards for evaluating the effectiveness of AI-based military simulation and training prevents meaningful cross-study comparison and inhibits evidence-based procurement decisions. The development of standardized metrics, encompassing training fidelity, skill transfer, and long-term retention, is a pressing need.

IV. As new military technologies proliferate, including autonomous weapons systems, directed energy weapons, and AI-enabled cyber tools, the demand for simulation environments capable of modeling these threats grows rapidly. Research on AI-powered simulation of emerging threats remains underdeveloped, particularly with respect to the algorithmic and data requirements of high-fidelity modeling.

3 | Research Objectives

This study pursues four primary objectives:

I. Identifying AI applications: Examining how technologies such as machine learning, AR and VR, and big data analytics can be leveraged to develop advanced simulation environments and effective military training programs.

II. Assessing challenges and opportunities: Identifying the technical, financial, and organizational barriers to AI implementation in military training, and proposing actionable solutions.

III. Enhancing force readiness: Explaining how AI-driven simulation can improve the decision-making, tactical, and strategic capabilities of military personnel.

IV. Providing a localization framework: Proposing an adaptable framework for integrating AI into military training programs in developing nations, taking into account local resource constraints and organizational contexts.

4 | Research Method

This study employs a structured qualitative review methodology. The objective is to collect, synthesize, and critically analyze the existing literature on AI applications in military simulation and training, thereby producing a comprehensive and evidence-based account of the current state of knowledge, including its practical opportunities, limitations, and unresolved research questions.

4.1 | Source Population

The source population comprises peer-reviewed articles, scholarly books, technical reports, and authoritative institutional documents on AI applications in military simulation and training published between 2010 and 2025. Sources were drawn from Scopus, Web of Science, IEEE Xplore, PubMed, and Google Scholar, encompassing both English-language and Persian-language publications.

4.2 | Sampling and Inclusion Criteria

Source selection followed a purposive sampling strategy guided by the following inclusion criteria:

I. Direct relevance to AI applications in military simulation or training contexts.

II. Publication in peer-reviewed journals or proceedings of internationally recognized academic conferences.

III. Provision of specific empirical or theoretical findings related to AI technologies, implementation challenges, or training outcomes.

IV. Availability of full-text access.

4.3 | Quality Assessment

A structured evaluation checklist was employed to assess the quality and credibility of all included sources. Checklist criteria encompassed journal or publisher reputation, methodological rigor, transparency of research objectives and findings, and the extent of citation by subsequent scholarship. To ensure validity, the checklist was developed with reference to established systematic review standards and independently verified by two researchers. Inter-rater reliability was assessed via agreement coefficient calculation; discrepancies were resolved through structured discussion or third-party arbitration. Reference management software (EndNote or Zotero) was used to organize and track all sources.

4.4 | Data Analysis

Qualitative content analysis was applied to data extracted from included sources, proceeding through the following stages:

I. Initial coding: Identification of key concepts, including AI application types (machine learning, VR/AR, data analytics), implementation challenges (cost, infrastructure, cybersecurity), and training outcomes (readiness, decision-making speed, error reduction).

II. Thematic categorization: Grouping of codes into major thematic domains, including technologies employed, learning outcomes, and implementation barriers.

III. Comparative synthesis: Cross-source analysis to identify convergent findings, divergent perspectives, and underexplored research areas.

5 | Applications of AI in Military Simulation and Training

AI functions as a transformative technology across multiple domains of military simulation and training by enhancing realism, adaptability, and analytical capability. Advanced AI-driven methods support the development of sophisticated training environments that replicate complex operational conditions, improve decision-making processes, and enable more effective preparation for uncertain scenarios. The major application areas include complex scenario simulation, virtual and Augmented Reality (AR) training, intelligent decision support, adaptive learning systems, and enemy behavior modeling.

Advanced algorithms, including deep learning, reinforcement learning, and agent-based modeling, enable AI systems to reconstruct operational environments containing multiple interacting variables. These systems can simulate dynamic multi-threat scenarios that incorporate human behavior, terrain variations, logistical limitations, and unexpected disruptions [4], [13]. Artificial neural networks analyze and integrate information from diverse data sources, while cloud computing infrastructure supports large-scale simulations involving millions of interconnected variables. Through real-time scenario adaptation and continuous data processing, AI-based simulations allow commanders and trainees to identify vulnerabilities, evaluate possible outcomes, and prepare for unpredictable operational challenges.

AI-enhanced virtual and augmented reality (VR/AR) platforms provide immersive and interactive training environments that closely replicate real operational conditions. Within these systems, AI acts as a dynamic control mechanism by monitoring user behavior, including decision-making speed, stress responses, and performance patterns, to automatically modify scenario complexity and training requirements [14], [15]. By reproducing psychological pressures similar to those encountered in real missions, VR/AR-based systems

support the development of cognitive resilience, emotional control, and effective decision-making skills required in high-pressure environments.

AI also plays a critical role in data analytics and intelligent decision support by processing operational information from multiple sources, detecting hidden patterns, and producing strategic recommendations [16], [17]. Predictive analytics and data-driven modeling allow military organizations to identify strategic vulnerabilities, recognize potential opportunities, and determine optimal courses of action. In contemporary warfare, where rapid and accurate decision-making is a key operational advantage, AI-powered decision support systems enhance situational awareness and improve strategic effectiveness [11].

Machine learning algorithms further contribute to adaptive and personalized training by analyzing individual performance indicators, including reaction time, accuracy, and problem-solving methods, to create customized training programs. These systems can predict areas where trainees may encounter difficulties and recommend targeted improvements based on identified weaknesses. Such personalized approaches enable trainees to focus on specific skill deficiencies, increasing training efficiency and supporting long-term performance development.

AI also enables advanced enemy behavior modeling by simulating complex and adaptive adversary actions, including potential tactics, strategies, and non-linear responses. Data-driven predictive models can reconstruct possible enemy decision-making sequences by considering both rational choices and irregular behavioral patterns. Realistic enemy behavior simulations improve operational planning, support the creation of flexible countermeasures, and strengthen strategic adaptability by preparing personnel for a broader range of possible operational scenarios [18], [19].

6 | Opportunities for AI Adoption in Military Training

AI adoption in military training presents several significant opportunities that can enhance efficiency, effectiveness, and operational preparedness. By integrating AI-driven technologies into training systems, military organizations can improve resource management, increase personnel safety, develop adaptable training environments, strengthen combat readiness, and support continuous learning across geographically distributed forces.

AI-based simulation provides substantial opportunities for cost reduction by decreasing reliance on expensive physical equipment, extensive logistical infrastructure, and large-scale personnel deployment. Complex training exercises can be conducted within digital environments that replicate realistic operational conditions without requiring the same level of physical resources. The financial savings generated through simulation-based training can be redirected toward research and development, capability enhancement, and broader operational improvements [20], [21].

AI-enabled simulation also improves personnel safety by reducing the physical risks associated with traditional live training exercises. By allowing trainees to experience challenging and high-risk scenarios within controlled virtual environments, these systems minimize the possibility of injury while maintaining training effectiveness. Furthermore, the psychological safety provided by simulated environments can increase trainee confidence and encourage active participation in demanding scenarios. The ability to replicate stressful operational conditions also helps personnel develop improved stress management skills and decision-making abilities under pressure, contributing to enhanced real-world performance.

Another major opportunity offered by AI is increased scenario flexibility and adaptability. AI algorithms allow training scenarios to be rapidly designed, modified, and updated according to emerging threats, changing operational requirements, and new intelligence information. Adaptive systems can incorporate real-time data and generate relevant simulations, enabling military organizations to maintain effective preparation despite evolving geopolitical conditions and technological developments [22], [23].

AI-based training environments further contribute to enhanced combat readiness by providing realistic and continuously evolving operational experiences. Through simulated missions and exercises, personnel can

improve their ability to respond quickly and accurately in complex situations. AI-generated performance analysis and immediate feedback allow trainees to identify weaknesses, refine skills, and accelerate competency development. As a result, AI-supported training contributes to improved readiness at both individual and organizational levels [24].

Finally, AI facilitates continuous and distributed learning by enabling access to structured training opportunities regardless of time or location. AI-powered platforms reduce dependence on centralized training facilities and allow personnel to maintain their skills through flexible and accessible learning environments. This capability is particularly valuable for reserve forces and geographically dispersed operational units, where maintaining readiness and skill proficiency can be challenging. Through continuous learning support, AI contributes to a more adaptable and resilient military training system.

7 | Implementation Challenges

The implementation of AI-based military training systems involves several significant challenges that must be addressed to ensure effective and sustainable adoption. Although AI provides substantial benefits for simulation, decision support, and adaptive learning, its integration requires overcoming financial, technical, security, and organizational barriers.

One of the primary challenges is the high initial capital investment required for developing and deploying AI-enabled training infrastructure. Advanced systems require significant resources, including high-performance computing platforms, specialized software, data processing capabilities, and precision sensor technologies. For organizations operating under limited defense budgets, these expenses can create major obstacles to adoption. Furthermore, the continuous costs associated with maintenance, upgrades, and technological improvements increase the financial burden, particularly because rapid advancements in AI technology may cause existing systems to become outdated within relatively short periods [7], [25].

Another major challenge is the shortage of specialized personnel capable of designing, implementing, and maintaining AI systems. Effective deployment requires expertise in areas such as machine learning, data science, AI engineering, and complex system integration. Since demand for these skills is high across global industries, defense organizations may face difficulties competing for qualified professionals, particularly when operating within traditional recruitment and compensation frameworks. Reliance on external specialists, foreign expertise, or commercial technology providers may also create additional concerns related to security, independence, and technological sovereignty.

Data security and cybersecurity vulnerabilities represent another critical challenge in AI-based military training. These systems depend on large volumes of sensitive operational data, making them potential targets for cyberattacks and information exploitation. Protecting AI platforms requires advanced cybersecurity measures, including strong encryption, secure data management practices, and intrusion detection mechanisms. However, implementing these protective measures increases system complexity and operational costs. A successful breach could expose sensitive training methodologies, operational capabilities, or strategic information, resulting in significant security consequences.

Organizational and cultural resistance can also limit the effective adoption of AI within military institutions. The introduction of AI technologies often involves changes to established procedures, decision-making structures, and workforce roles. Concerns regarding organizational disruption, potential job displacement, or uncertainty about the reliability of AI systems may create resistance among personnel [9], [26]. Such resistance can delay implementation, reduce institutional support, and negatively influence the success of AI integration initiatives.

Finally, system integration complexity presents a substantial technical and organizational challenge. Integrating AI capabilities into existing military infrastructures, including legacy command-and-control systems, communication networks, and simulation platforms, requires extensive coordination and modernization efforts. Ensuring compatibility between new AI solutions and existing systems involves

addressing issues such as interface standardization, data interoperability, and operational continuity during transition periods. In many cases, upgrading older infrastructure to support AI integration can require significant financial investment and technical resources [18], [27].

8 | Discussion

The findings of this review affirm that AI represents a transformative capability for military training and simulation, with applications spanning scenario reconstruction, personalized learning, enemy behavior modeling, and real-time decision support. The breadth of potential benefits—cost reduction, enhanced safety, increased realism, and improved operational readiness—positions AI as a strategic priority for modern defense organizations.

At the same time, the analysis reveals that the realization of these benefits is contingent upon addressing substantive challenges. The high capital costs of AI infrastructure, the scarcity of specialized expertise, cybersecurity vulnerabilities, organizational resistance, and integration complexity each represent non-trivial barriers, particularly for resource-constrained organizations. These challenges are compounded by research gaps that limit the evidence base available to policymakers and military planners.

The convergence of these findings suggests the need for differentiated implementation strategies. Advanced military organizations may focus on frontier AI applications, including generative AI for dynamic scenario creation and quantum computing to accelerate simulation processing. Resource-constrained organizations may benefit more from modular, scalable AI solutions that integrate with existing infrastructure and prioritize cost-efficiency over capability maximization. In both cases, investment in human capital—through specialist training and knowledge transfer—is identified as a critical enabling factor.

The localization challenge merits particular attention. Effective AI adoption in developing military contexts requires not only the transfer of technology but the development of indigenous expertise, the creation of locally relevant training data, and the adaptation of AI architectures to available computational resources. International partnerships and collaborative research programs may accelerate this process while reducing associated costs and security risks.

9 | Conclusion

This study has conducted a structured review of AI applications in military simulation and training, examining the opportunities, challenges, and research gaps that characterize this rapidly evolving domain. The evidence demonstrates that AI offers substantial and multidimensional benefits for military training effectiveness, including the capacity to reconstruct complex operational environments, personalize learning at scale, and support data-driven decision-making under pressure.

However, the path to widespread AI adoption in military training is not without obstacles. High implementation costs, specialist workforce constraints, cybersecurity risks, organizational resistance, and system integration complexity collectively represent a formidable set of barriers. Addressing these challenges will require coordinated investment across technological, human capital, and organizational dimensions.

Future research should prioritize longitudinal evaluation of AI training impacts, the development of internationally standardized assessment frameworks, and the creation of context-sensitive implementation models suitable for resource-constrained defense environments. The development of AI-powered simulation capabilities for emerging threats—including autonomous weapons and advanced cyber operations—represents an additional and urgent research priority.

The integration of AI into military training is not a singular technological upgrade but a fundamental transformation of how military forces develop and sustain operational capability. Realizing the full potential of this transformation requires not only technical innovation but sustained institutional commitment, strategic planning, and a willingness to invest in the educational and organizational infrastructure that effective AI adoption demands.

9.1 | Recommendations

I. Develop international research collaborations to reduce development costs, facilitate knowledge exchange, and accelerate the localization of AI training technologies.

II. Invest in specialist workforce development through dedicated training programs, academic partnerships, and competitive compensation to build sustainable indigenous AI expertise.

III. Strengthen cybersecurity protocols for AI training systems, including multi-layered encryption, intrusion detection, and regular security audits to protect sensitive operational data.

IV. Commission longitudinal studies to assess the long-term training outcomes and psychological effects of AI-based simulation, informing evidence-based program refinement.

V. Develop and promote standardized international frameworks for evaluating AI-based military training effectiveness, enabling cross-organizational learning and evidence-based investment decisions.

VI. Establish modular, scalable AI training platforms that can be deployed incrementally within existing military infrastructure, reducing the barrier to initial adoption.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data Availability

All data are included in the text.

Conflicts of Interest

The authors declare no conflict of interest.

References

[1] Amirlu, M. (2025). Interactive approach in military training. *Studies in Language, Literature, and Strategic Discourse*, *3*(4), e722812. https://www.jlsmt.ir/article_722812_en.html

[2] Lokyan, A., Baghdasaryan, S., & Hovhannisyan, H. (2025). Enhancing psychological training in military personnel: Modern approaches, systemic assessments and hands-on recommendations. *Asian Journal of Psychiatry*, *106*, 104442. https://doi.org/10.1016/j.ajp.2025.104442

[3] Piele, C., Coman, M. M., & Maniu, V. (2025). Emerging and disruptive technology as multiplier for military training: Exploring the development of a hybrid synthetic training environment. *Land Forces Academy Review*, *30*(2), 239–248. https://doi.org/10.2478/raft-2025-0023

[4] Horowitz, M. C., & Scharre, P. (2021). *AI and international stability: Risks and confidence-building measures*. https://s3.us-east-1.amazonaws.com/files.cnas.org/documents/AI-and-International-Stability-Risks-and-Confidence-Building-Measures.pdf

[5] Tolk, A., Barry, P., & Doskey, S. C. (2022). Using modeling and simulation and artificial intelligence to improve complex adaptive systems engineering. *International Journal of Modeling, Simulation, and Scientific Computing*, *13*(02), 2241004. https://doi.org/10.1142/S1793962322410045

[6] Sajadieh, S. M. M., & Noh, S. Do. (2025). From simulation to autonomy: Reviews of the integration of artificial intelligence and digital twins. *International Journal of Precision Engineering and Manufacturing-Green Technology*, *12*(5), 1597–1628. https://doi.org/10.1007/s40684-025-00750-z

[7] Gholam Nejad, P., Gholami, M., & Pourmakary, A. (2019). Military applications of the internet of things, with emphasis on IR Iran Air Force missions. *Military Science and Tactics*, *15*(49), 141-163. (**In Persian**). https://doi.org/10.22034/qjmst.2019.38084

[8] Rashid, A. Bin, Kausik, A. K., al Hassan Sunny, A., & Bappy, M. H. (2023). Artificial intelligence in the military: An overview of the capabilities, applications, and challenges. *International Journal of Intelligent Systems*, *2023*(1), 8676366. https://doi.org/10.1155/2023/8676366

[9] Kaveh, S., & Asefi, S. (2018). Artificial intelligence and the future of weapons. *Fourth International Conference on Science and Technology with a Sustainable Development Approach*, Shiraz, Iran. Civilica. (**In Persian**). https://civilica.com/doc/900553/

[10] Morgan, F. E., Boudreaux, B., Lohn, A. J., Ashby, M., Curriden, C., Klima, K., & Grossman, D. (2020). *Military applications of artificial intelligence: Ethical concerns in an uncertain world*. https://www.rand.org/pubs/research_reports/RR3139-1.html

[11] Kania, E. B. (2022). Artificial intelligence in China's revolution in military affairs. In *Defence Innovation and the 4th Industrial Revolution* (pp. 65–92). Routledge. https://doi.org/10.1080/01402390.2021.1894136

[12] Yatsyk, O., & Zharova, L. (2024). Applications of AI in military decision-making and strategic planning. *Business, Economics, Sustainability, Leadership and Innovation*, (12), 71–78. https://doi.org/10.37659/2663-5070-2024-12-71-78

[13] Esmaeeli, E., Collins, A. J., Varmazyar, M., & Khorshidnia, M. (2025). Agent-based modeling applications in maintenance systems: A systematic review. *Journal of Quality in Maintenance Engineering*, *31*(3), 325–349. https://doi.org/10.1108/JQME-03-2024-0028

[14] Ghafouri, R. (2020). *Artificial intelligence and cloud computing: Complementary technologies* [presentation]. The 5th international conference on innovative technologies in science, engineering and technology. **(In Persian)**. https://elmnet.ir/doc/21194617-89106

[15] Al Balushi, J. S. G., Al Jabri, M. I. A., Palarimath, S., Maran, P., Thenmozhi, K., & Balakumar, C. (2024). Incorporating artificial intelligence powered immersive realities to improve learning using virtual reality (VR) and augmented reality (AR) technology. *2024 3rd International Conference on Applied Artificial Intelligence and Computing (ICAAIC)* (pp. 760–765). IEEE. https://doi.org/10.1109/ICAAIC60222.2024.10575046

[16] Rastgar, A., Farrokhizadeh, F. (2020). An investigation and analysis of the relation between futures study and knowledge management in a military higher education center. *Future Studies of the Islamic Revolution*, *1*(3), 7-30. (**In Persian**). https://jms.ihu.ac.ir/article_206284.html

[17] Nayak, A., Satpathy, I., & Khang, A. (2026). Employing AI-powered clinical decision support to revolutionize healthcare: Integrating data analytics with informed diagnostics. In *Revolutionizing Digital Healthcare Through Artificial Intelligence and Automation* (pp. 433–446). Elsevier. https://doi.org/10.1016/B978-0-443-36434-1.00030-6

[18] Scharre, P. (2018). *Army of none: Autonomous weapons and the future of war*. W. W. Norton & Company. https://www.amazon.com/Army-None-Autonomous-Weapons-Future/dp/0393608980

[19] Senanu, J. H. (2026). *Artificial intelligence security and adversarial machine learning: Threat models, defensive strategies, and forensic implications for trustworthy AI systems*. https://dx.doi.org/10.2139/ssrn.6144306

[20] Allen, G. C. (2019). *Understanding China's AI strategy: Clues to Chinese strategic thinking on artificial intelligence and national security*. Center for a New American Security Washington, DC. https://www.cnas.org/publications/reports/understanding-chinas-ai-strategy

[21] Kumar, A., Saudagar, A. K. J., Kumar, A., Alkhrijah, Y. M., & Raja, L. (2025). Innovating medical education using a cost effective and scalable VR platform with AI-Driven haptics. *Scientific Reports*, *15*(1), 26360. https://doi.org/10.1038/s41598-025-10543-8

[22] Ayoub, K., & Payne, K. (2016). Strategy in the age of artificial intelligence. *Journal of Strategic Studies*, *39*(5–6), 793–819. https://doi.org/10.1080/01402390.2015.1088838

[23] Khayat, M., Barka, E., Serhani, M. A., Sallabi, F., Shuaib, K., & Khater, H. M. (2025). Empowering security operation center with artificial intelligence and machine learning—A systematic literature review. *IEEE Access*, *13*, 19162–19197. https://doi.org/10.1109/ACCESS.2025.3532951

[24] Chang, W., Swift, A. W., & Shulga, L. V. (2026). Artificial intelligence (AI) preparedness in hospitality: A framework and research agenda for building organizational capacities. *International Journal of Contemporary Hospitality Management*, *38*(4), 1237–1256. https://doi.org/10.1108/IJCHM-04-2025-0525

[25] Hirsch-Kreinsen, H. (2024). Artificial intelligence: A "promising technology." *AI & Society*, *39*(4), 1641–1652. https://doi.org/10.1007/s00146-023-01629-w

[26] Scholes, M. S. (2025). Artificial intelligence and uncertainty. *Risk Sciences*, *1*, 100004. https://doi.org/10.1016/j.risk.2024.100004

[27] Van Hoang, T. (2024). Impact of integrated artificial intelligence and internet of things technologies on smart city transformation. *Journal of Technical Education Science*, *19*(Special Issue 01), 64–73. https://doi.org/10.54644/jte.2024.1532