

Adaptation of Modern Technologies and Challenges in the Defense Sectors

By

Azad Singh, Assistant Professor

Faculty of Law, SGT University, Gurugram, Haryana, India

Email Id- azad.law@sgtuniversity.org

Sh. Sachin Gupta, Chancellor

Department of Management, SOMC, Sanskriti University, Mathura, Uttar Pradesh, India

Email Id- chancellor@sanskriti.edu.in

Ms Mansi Jain, Assistant Professor

School of Law, Galgotias University, Greater Noida, Uttar Pradesh, India

Email Id- mansi.jain@galgotiasuniversity.edu.in

Abstract

Modern technologies plays a significant role in all sectors including defense sectors. Developing military strength is difficult, especially while the government strives to satisfy the demands of economic growth to offer social protection and a higher quality of life for its citizens. Technological supremacy is seen as a critical component of defense effectiveness, and Research and Development (R&D) play a critical role in gaining access to essential advanced technologies. In the short to medium term, as well as in the long term, the Indian Army, as a major component of the Army, must also be prepared to meet asymmetric, informational, and conventional challenges beyond our western frontier. Previously due to the absence of technological advancements, the defense sector faces a lot of challenges in every step but by introducing modern technologies in the defense sector the military's get several benefits and they are becoming more powerful than previous. The fundamental goal of this study is to demonstrate how current technology is being adopted by the military around the world, as well as the obstacles they face. Military personnel face a number of technical challenges, which have a significant impact on their ability to train. The introduction of new and current technology in the defense sector will help the armies to boost their workforce and also contribute to future wars.

Keywords: Artificial Intelligence, Defense, Modern Technologies, Military, Research and Development.

Introduction

Technology has played a significant role in military expenditures and arms-producing countries in Second World War. Aside from the fact that no serious threat of war has existed since the 1990s, defense Research and Development (R&D) consumes a considerable portion of military and public R&D spending (Fraga-Lamas et al., 2016). The uncertainty surrounding defense affairs, as well as the necessity to prevent strategic shocks, have resulted in this technology-centric paradigm. However, one can argue if such a framework is still appropriate for today's military requirements. This is a supply-side trend: military companies have built a business structure that requires them to launch new programs in order to survive, resulting in a

high degree of defense research and development. The Defense Technology Framework (DTF) lies at the heart of the Department of Defense's thinking and strategy. Given the breadth and relentless rate of technological development in a resource-constrained context, some effort concentrating is needed ([Bitzinger, 2021](#); [Koo et al., 2020](#); [Vorm, 2020](#)).

The defense department must determine the source of the most significant technology problems and possibilities. It requires access to the appropriate capability base (people, information, facilities, industrial capacity, and so on) in order to comprehend and create innovations with the most potential cross-cutting applications. It must also leverage such technologies at a rate that is relevant in order to have a transformational real-world influence. The purpose of this DTF is to offer the essential concentration. According to the government, the core technologies listed here will be important in the development of weapons that deliver decisive and cheap military effect in future conflicts. As a result, this Framework will guide and shape Defense policy, strategy, and investment planning. It also serves as a demand signal, allowing the Defense business, including internal drug delivery carriers, to anticipate and plan for future capabilities needs.

India must simultaneously build on its military capability in the modern setting as it climbs in stature, technologically as well as economically, towards a more prominent place in the region and the globe, to deflect the challenges and risks that it is expected to confront along the road from prospective enemies. However, given India's budgetary limits, developing military strength is difficult, especially while the government strives to satisfy the demands of economic growth in order to offer social protection and a higher quality of life for its citizens. The paucity of finances is exacerbated by bureaucratic waffling, risk aversion, the Army's frequent changes in quality criteria, and the occurrence of corruption allegations, which result in unforeseen blacklisting of suppliers. As a result, not only is it critical to efficiently identify the Army's future orientation as well as the equipment requires in its role as the Indian military's largest and strongest component, but it is also critical to found a way forward to establish speed and reliability up the procurement procedure while dealing with issues which may prove to be a challenge to the force.

People are aware, however, that essential technological advancements will mostly occur outside the government sector, and that comprehensive Defense modernization will need collaboration with business, academia, and foreign partners. Notwithstanding the conclusion of the Cold War, armed forces, particularly in arms-producing nations, continuously to devote a significant portion of their investment determination to defense. Rising powers like as Brazil, India, and China are allocating a growing portion of their defense spending to research and development, despite the fact that these nations did not previously invest much in this area. One could wonder if any such spending is motivated by a need for innovative features in response to current or future concerns as well as challenges, and if defense R&D results meet expectations. Since the 1970s, defense R&D has been spreader criticized in the economic literature for its significant opportunity costs as well as relative inefficiency when contrasted to civilians R&D.

The primary objective of this study is to demonstrate the adoption of modern technologies and challenges faced by militaries over the globe. Through this study the author wants to identify the importance of modern technologies in defense sector and how it assist to improve the military's skill. The present study is characterized into several sections where the first of which is introduction and the second section is the reviews and suggestions of previous

studies from various literatures. After that the discussion section are discussed where the author elaborates the performance growth of Indian militaries and the need of technologies in the defense sectors and lastly the conclusion of this study is declared where the author provide the final outcomes and suggestions of the present study.

Literature Review

R. S. Mohril et al. discussed about maintenance of administration structure for army equipment's. The authors proposed that military equipment maintenance is critical to obtaining better levels of battle preparedness. The sheer volume of military equipment and its dispersion around the globe makes upkeep a difficult undertaking. Decision-makers are constantly interested in understanding the most up-to-date state of equipment, developing effective maintenance programs, and accurately predicting mission reliability. To meet this need, military equipment maintenance data must be kept at a high level of granularity and precision, including information on every military equipment's lowest maintainable unit. The authors aim is to develop a revolutionary block chain-based architecture for military maintenance management that is both comprehensive and future-proof. As per this study it depicts a military equipment maintenance scenario before discussing the many options accessible within the block chain technology, and the design of the system block chain. Smart contracts are used in the proposed framework to make monitoring as well as validation more stringent and with less human interaction (Mohril et al., 2021).

G. Cesnakas established that implications of technological advancements in military performance. His study claims that technology advancements alter warfare and encourages innovators to reconsider operational, tactical decisions, and strategic, raising new ethical as well as legal anxieties. The author's aim to introduce how technological advancements enhanced the abilities of the militaries and provide potential to fight with their problems. According to the author the smaller countries never go up against innovatively progressed nations, hence they should adjust by expanding their battling force and adjusting to shield in regions where specialized advantage is diminishing and vulnerability is expanding. The finding suggest that small states must also think outside the box when it comes to defense, concentrating on non-conventional weapons, focusing on fighting without obvious command structure, investing in officers and troops personal talents, and preserving symbiotic relationships with technologically superior partners (Česnakas, 2019).

P. Fraga-Lamas et al. discussed about Internet of things for community as well as defense protection assessment. It has shown to be a good fit for industries that manage a big amount of assets as well as coordinate complicated, dispersed operations. As indicated by their evaluation, IoT innovations can possibly change contemporary battle and bring benefits like those found in industry. It recognizes circumstances in which defense too as "Public Safety" (PS) could utilize more grounded business IoT abilities to give warfighters and people on call greater survivability while bringing down costs and working on functional proficiency and adequacy. Their study examines gaps and inadequacies in existing IoT systems across the field of military as well as mission-critical scenarios, as well as the primary tactical needs and architecture. The analysis identifies the key barriers for widespread adoption and proposes a research path for allowing a cost-effective IoT for defense and public safety (Fraga-Lamas et al., 2016).

J. Jackson et al. argued that military service is a critical turning point in one's life. Military service is a crucial turning point in a person's life, and it is associated with severe life implications as a result. According to the author the adaptation of modern technologies in defense will promote their working skills and also assist to enhance the military's performance. As per their study military training has been conducted for personality changes and for promoting their skills during battle. Their findings show that military experiences may have a long-term impact on individual-level characteristics (Jackson et al., 2012).

H. Campbell discussed about the influences of military management in the international system. The authors study looks to examine the dynamics impacts to the militarization of US and Africa interrelation as well as their effects on transformation and security in Africa. The author wants to highlight the economic, social attempts as well as ideological which shapes the formulation and implementation of US policy regarding Africa's militarization. The author of this study argues that those who have militarized US–Africa connections have a view of surveillance in Africa which serves the interests of a segment of US civilization rather than the interests of Africans. The outcomes shows that Africans to oppose the militarization of international strategy and war preparing of time; Africans should characterize security in their own humanism terms and reinforce their ability to shield and defend their own security advantages (Campbell, 2017).

The above reviews of the literatures show the problems faced by the military's due to absence of modern technology. In this study the author discussed the importance of technology in defence sector. Utilization of technological advancements in defence sector will promotes the skills and abilities of the armed forces and they are able to fight with enemies with less problems. The government must be introducing the technology in defence sector which makes the army more powerful than previous.

Discussion

The researcher investments in defense research and technology which allows us to neutralize military actions and surpass any benefits which adversaries may pursue. It also helps to broaden policymaker's military choices, including alternatives to fighting in achieving the goals of supporting stability as well as averting conflict. Defense modernization will need collaboration with business, academia, and foreign partners.

1.1. Utilization of Modern Technologies in Defense sector:

Military had sent complex innovation since the 1940s, because of a tenacious quest for R&D and the formation of an enormous super advanced military modern base. Mechanical matchless quality is viewed as a basic part of safeguard viability, and R&D assumes a basic part in accessing fundamental trend setting innovations. This explains why, since World War II, the United States (U.S) and Western European countries have devoted a significant portion of their Research and Development budgets to defense applications. A long time before middle of 20th centuries, innovation played a restricted part, yet World War I and, much more in this way, World War II addressed a critical shift. This last option laid out the worth of logical and mechanical progression to military powers, subsequently defending high R&D spending in most modern nations. This was a critical shift that brought about "Large Science," as portrayed. For instance, R&D spending in the U.S was simply 0.9 percent of the government financial plan in 1940, however had ascended to over 10% by 1960, with safeguard R&D getting most of the new funds (Billing et al., 2021).

A solid and exceptional military permits a country to endure attack and battle ridiculous hostility from abroad, as well as manage homegrown disturbance. It goes about as a discouragement and represents the country's tactical strength and capacity to protect itself against unfamiliar enemies. As a result, every country must offer cutting-edge technology to its military and upgrade its existing arsenal of weapons and surveillance systems. In order to improve its security and intelligence capacities, as well as safeguard its territorial integrity, India must also develop a robust military force that is equipped with all types of technologically sophisticated defensive equipment.

Countries throughout the world that are coping with internal security issues, border disputes with unfriendly neighbors, terror threats, or are in a war-like situation are raising defense expenditure. The countries think that only a robust military and security system can allow them to overcome any threat to their independence or sovereignty. The creation of highly powerful weaponry has stemmed from technological advancement, and many nations currently possess them. A couple of models are long range rocket weapons, atomic fueled submarines, secrecy contender flies, and automated aircrafts. To deal with any unforeseen incident, each country requires a robust and up-to-date military and security apparatus. As a result, in addition to buying new defense items, special attention should be paid to ensuring that the armory systems never become superseded in a limited year.

Furthermore, such things must be able to be updated with minimal effort. Any country cannot ignore the need of modernization since it is the key to dealing with any sort of unforeseen hostility, whether internal or external. In the present global scenario, maintaining India's regional autonomy has become critical. India has to demonstrate its existence as well as sovereignty over the border regions, and in order to do so, it requires modernized defense products as well as strategic autonomy over them. This essential independence might be achieved by fostering an independent safeguard area, which would help the Indian economy over the long run. Increased domestic defense manufacturing is urgently needed to satisfy the needs of the armed services while also reducing the load on the exchequer.

To satisfy the present requirements of contemporary warfare, India's defense goods need to be modernized. To foster a solid security structure India needs to further develop its reconnaissance framework, which would require the establishment of updated radars and robots to recognize dubious action and intruding at the line at the earliest opportunity. India must also recognize that, in times of crisis, it cannot always rely on emergency acquisitions of defense weapons, as seen by recent border battles with Chinese forces and escalating tensions along the northern frontiers. This has resulted in increased domestic and international weapon purchases, yet reliance on imports for emergency purchases contributes to exorbitant spending. Under the “Aatmanirbhar Bharat Abhiyan”, attempting to make India an industrial center is a start in the right way. Encouraging investments in expansion, researches as well as production in the defense industries would help to improve the manufacture of defense products while also creating jobs.

In the defense industry, “Aatmanirbhar Bharat” would minimize reliance on imports, resulting in lower foreign exchange spending and a significant increase in operational preparedness. Domestic production will spur the development of several auxiliary businesses while also generating significant money through the sale of defense items to other countries. Changing the very nearly two hundred years old Ordnance Factory Board into seven state-claimed corporate associations in accordance with Aatmanirbhar Bharat's vision won't just lift

seriousness, yet in addition improve quality and cost-effectiveness while keeping up with safeguard area confidence. This will also assist to reduce the trade imbalance (Dominese, 2020; Jang & Kim, 2018; Park & Kang, 2020). The Defense Acquisition Procedure, (DAP), aims to bring the Aatmanirbhar Bharat Abhiyan into line and assist it by emphasizing on self-reliance, strengthening local manufacturing, and encouraging private sector participation.

Following Prime Minister Narendra Modi call for “Aatmanirbharta” and the indigenization of commodities across all sectors, significant efforts have been made to indigenize the Indian military industry and reduce the country's large defense import bill. In this regard, the debut of the Tejas Light Combat Aircraft is a great success, and a fresh order for 83 Tejas fighter planes would definitely help boost the Indian Air Force while also strengthening the Indian defense sector's trust. Furthermore, because 209 defense products are prohibited from being imported, they will have to be manufactured in India.

An extraordinary asset has been laid out to help new companies and Small and Medium-Sized Enterprises (SMEs) in the advancement of plan and imaginative innovations in the aviation as well as guard areas. To support homegrown assembling and the utilization of new innovation in guard items, the public authority has permitted Foreign Direct Investment of up to 74 percent in protection fabricating through the Automatic Route, considering the dynamic commitment of the private area. Several foreign investors or Indian business could invest straightly in the defense industry through the Automatic Route even without Reserve Bank of India (RBI) or the Government of India's prior permission. This would make doing business in India easier and stimulate investment in the defense sector. The Army needs the following technology and weaponry as a necessity to replace or revive antiquated equipment as part of the ability expansion program, as shown in Figure 1.

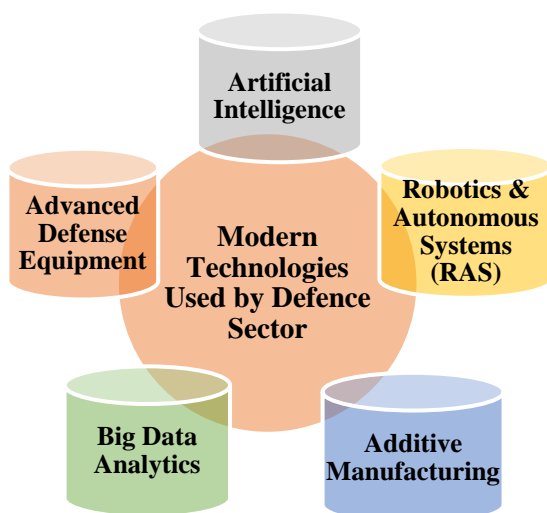


Figure 1: Represents the Utilization of Modern Technologies by Defense Sector for Enhance their Training Skills.

1.2. Use of Artificial Intelligence in Defense:

Defense technology is defined as technology that is utilized or put to use for different military goals or to fight conflicts. Certain sorts of technology, for example, are purely military or defensive in nature. If someone isn't properly trained to manage this technology, they can be deadly. Although defense technology is primarily intended for military use, it has been used for civilian reasons on several occasions. In addition, technology designed for civilians have

been adapted for military usage. Professional engineers as well as researchers have investigated and produced the technologies that will be employed for defense purposes. The defense forces utilize this technology to defeat their adversaries. Innovative concepts have a significant role in the development and influence of current defense technologies. It is crucial to have the information, which is critical in such development, in order to produce result-oriented new ideas. This is the ideal moment to prepare for a future in which Artificial Intelligence (AI) can be given command of military operations or conflict (Gill, 2021). AI advancements will open up new possibilities in defense technologies (Goswami & Goswami, 2020). The potentials of waging a war may be increased by utilizing AI in military operations, in addition to improving the performance of military forces. Many countries throughout the globe are adopting AI to improve the effectiveness of their defense forces.

- The utilization of deep learning machines, which necessitates the utilization of large amounts of data as well as artificial neural networks.
- Creating a highly developed human-machine partnership in which AI-powered technologies helps humans in making accurate and suitable military judgments.
- Using AI gadgets to bring each operator in the military networks together to carry out and complete any operations or assignment that is given to them.
- Bringing combined unmanned as well as manned systems for diverse types of machine and human conflicts.

AI would alter the characteristics of defense technology in the same way as airplanes, nuclear weapons, and computers did (Hatim, Siddiqui, & Kumar, 2020). How AI is Modifying the Face of Defense Technologies will directly reflect the abilities and experience of engineers and scientists in developing and creating technologies and applications (Goswami & Goswami, 2020). And in order to do so, a constant amount of data is required. This information is gathered through the day-to-day operations of numerous defense vehicles, ships, and planes. Physical defense exercises or training, war games, as well as digital simulation can all be used to generate AI data (Rastogi et al., 2020). Every sort of organization is looking for new ways to take advantage of digital computerization. Artificial Intelligence, Machine Learning, and Bots are some of the terms used to describe it. However, the military has recently established a strong desire to use such digital technologies (Mian & Kumar, 2019). For a nation's security, they must examine the existing volume of data properly, thoroughly, and quickly. The defense troops require a great deal of AI. AI can help them achieve their maximum potential while maintaining their current competency. The following are among the most important advantages utilizing AI in military operations are given below:

- Man-made consciousness can gather every one of the information acquired from various sensors as well as satellites and draw decisions. This may likewise make it simpler for military staff to make decisions on what measures to take.
- Military robots with man-made brainpower might be equipped for doing tasks or occupations all alone, saving living souls.
- The quantity of automated vehicles, for example, planes and battle tanks, will without a doubt increment. This will permit officials to pursue decisions all the more rapidly, set aside cash, and eliminate them from hazardous circumstances.
- Some land-based combat vehicles will employ Machine learning And AI in order to improve targeting capabilities.
- AI can help a drone take off as well as land without the need for human intervention, and it can even carry out the task itself.

1.3. Using Robotics & Autonomous Systems (RAS) in Defense:

Robotics and autonomous systems (RAS) already were extensively used in a range of societal domains, due to technological breakthroughs that reduced their costs and complexity while increasing their flexibility as well as ease of use. As a result, robots and the Multi Robot Systems (MRS) have had the ability to destabilize military operations in the coming years by allowing humans to undertake tasks that are now regarded too dangerous, difficult, or even unattainable for humans. RAS, on the other hand, have the potential to do more than just perform dirty, boring, as well as destructive military activities like surveillance and counter-mining; they have the potential to change the way military operations are carried out in the future, and even to enable the development of new types of missions.

1.4. Challenges Faced by militaries:

Warriors are one of a country's most important resources. They act as the country's guard dogs, guaranteeing that its inhabitants are safeguarded no matter what. Moreover, they are a sacrificial bundle that needs the nation's advantages before their own. One of the most troublesome positions on the planet is that of a fighter. To turn into an incredible officer, they should perform troublesome assignments and display extraordinary capabilities. Despite the difficulties, they always perform their tasks. While the soldier fulfils his responsibilities, the country sleeps soundly. The first as well as foremost essential duty of a military is to protect his or her country without respect for personal advantage.

An individual for the most part enlists in the military out of adoration for and to defend his country. Despite the fact that they know that they would experience different difficulties, they keep on doing as such for their country. Furthermore, a soldier protects his country's honor. They do not back down in the face of opposition; instead, they give it their all. It makes no difference to them if they have to devote their lives for the nation; they will gladly do so (Dutton et al., 2021). Soldiers must also maintain vigilance at all times. They are never off duty; whether they are resting or fighting on the battleground, they remains alert (McKay et al., 2021). Militaries all over the world faces various sorts of physical, mental and social challenges in their daily life are shown in Figure 2.

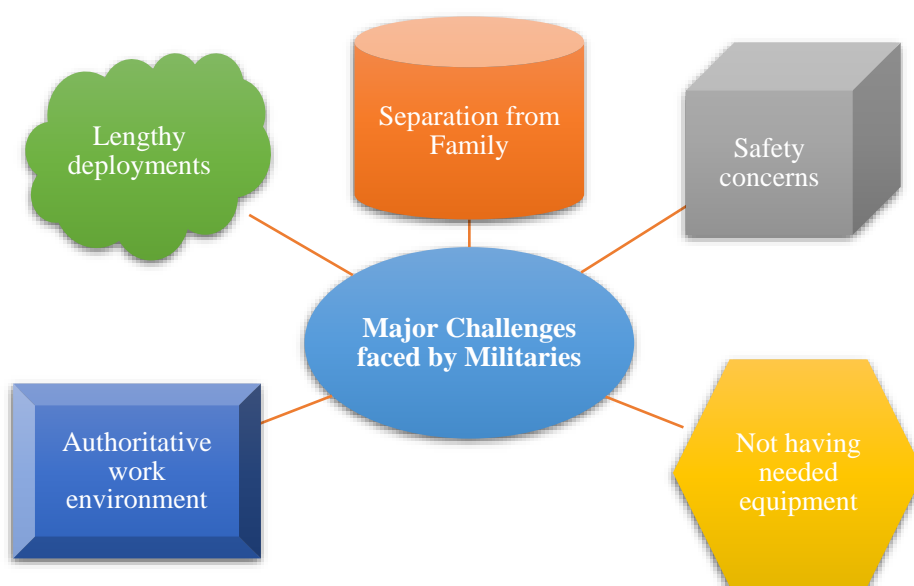


Figure 2: Illustrates the Major Challenges which is faced by the Militaries in all Over the World.

Being a soldier is not simple; in contrast, it is among the most difficult jobs one can undertake. Their lives are filled with difficulties and problems that no average person could face. For starters, they spend a lot of time away from their families. It causes them severe distress, and they are not even allowed to take vacations. Even at festivals, they are tasked with defending the country. Soldiers, too, must go through severe training in order to be healthy enough to fight conflicts. They continue despite being exhausted and physically demanding.

Conclusion

India must simultaneously build on its military capability in the modern setting as it climbs in stature, technologically as well as economically, towards a more prominent place in the region and the globe, to deflect the challenges and risks that it is expected to confront along the road from prospective enemies. However, given India's budgetary limits, developing military strength is difficult, especially while the government strives to satisfy the demands of economic growth in order to offer social protection and a higher quality of life for its citizens. The paucity of finances is exacerbated by bureaucratic waffling, risk aversion, the Army's frequent changes in quality criteria, and the occurrence of corruption allegations, which result in unforeseen blacklisting of suppliers. The research group might probably benefit from being more proactive and forward-thinking whenever it comes to prioritizing research. The Indian Army, as the primary component of the military, should be prepared to deal with asymmetric, informational, and conventional challenges from outside our western frontier, as well as from the Northern border, in the short to medium term as well as long term. Militaries faces a lot of technological concerns which really affects their training skills. Introducing advanced and modern technologies in defense sector will helps to increase the workforce of militaries and also helps during wars in future.

References

- Billing, D. C., Fordy, G. R., Friedl, K. E., & Hasselstrøm, H. (2021). The implications of emerging technology on military human performance research priorities. *Journal of Science and Medicine in Sport*, 24(10), 947-953. <https://doi.org/10.1016/j.jsams.2020.10.007>
- Bitzinger, R. A. (2021). Military-technological innovation in small states: The cases of Israel and Singapore. *Journal of Strategic Studies*, 44(6), 873-900. <https://doi.org/10.1080/01402390.2021.1947252>
- Campbell, H. G. (2017). The United States and security in Africa: The impact of the military management of the international system. *Africa Development*, 42(3), 45-71. <https://www.ajol.info/index.php/ad/article/view/167095>
- Česnakas, G. (2019). The implications of the technological trends in military on the defence of small states. *Lithuanian Annual Strategic Review*, 17, 273-293. <https://vb.lka.lt/object/elaba:57064333/>
- Dominese, G. (2020). Dual Technologies Sectors Innovation and Growth Civil and Defence Industries in Europe versus US and China. *Journal Transition Studies Review*, 27(1), 3-46. <https://ideas.repec.org/a/ase/jtsrta/v27y2020i1p3-46.html>
- Dutton, L. K., Rhee, P. C., Shin, A. Y., Ehrlichman, R. J., & Shemin, R. J. (2021). Combating an invisible enemy: the American military response to global pandemics. *Military Medical Research*, 8(1), 1-10. <https://doi.org/10.1186/s40779-021-00299-3>

- Fraga-Lamas, P., Fernández-Caramés, T. M., Suárez-Albela, M., Castedo, L., & González-López, M. (2016). A review on internet of things for defense and public safety. *Sensors*, 16(10), 1644. <https://doi.org/10.3390/s16101644>
- Gill, J. (2021). Hybrid Classification for Heart Disease Prediction using Artificial Intelligence. In 2021 5th International Conference on Computing Methodologies and Communication (ICCMC) (pp. 1779-1785). IEEE. <https://doi.org/10.1109/ICCMC51019.2021.9418345>
- Goswami, G., & Goswami, P. K. (2020). Artificial Intelligence based PV-Fed Shunt Active Power Filter for IOT Applications. In 2020 9th International Conference System Modeling and Advancement in Research Trends (SMART) (pp. 163-168). IEEE. <https://doi.org/10.1109/SMART50582.2020.9337063>
- Hatim, M., Siddiqui, F., & Kumar, R. (2020). Addressing Challenges and Demands of Intelligent Seasonal Rainfall Forecasting Using Artificial Intelligence Approach. In 2020 International Conference on Computation, Automation and Knowledge Management (ICCAKM) (pp. 263-267). IEEE. <https://doi.org/10.1109/ICCAKM46823.2020.9051516>
- Jackson, J. J., Thoemmes, F., Jonkmann, K., Lüdtke, O., & Trautwein, U. (2012). Military training and personality trait development: Does the military make the man, or does the man make the military? *Psychological science*, 23(3), 270-277. <https://doi.org/10.1177/0956797611423545>
- Jang, H.-S., & Kim, J.-B. (2018). Strategies for applying open source software to defense sector-Focused on developing countries. *International Journal of Advanced Science and Technology*, 118, 47-56. <https://scholarworks.bwise.kr/ssu/handle/2018.sw.ssu/34372>
- Koo, J., Oh, S.-R., Lee, S. H., & Kim, Y.-G. (2020). Security architecture for cloud-based command and control system in IoT environment. *Applied Sciences*, 10(3), 1035. <https://doi.org/10.3390/app10031035>
- McKay, K. A., Smith, K. A., Smertinaite, L., Fang, F., Ingre, C., & Taube, F. (2021). Military service and related risk factors for amyotrophic lateral sclerosis. *Acta Neurologica Scandinavica*, 143(1), 39-50. <https://doi.org/10.1111/ane.13345>
- Mian, S. M., & Kumar, R. (2019). Review on Intend Adaptive Algorithms for Time Critical Applications in Underwater Wireless Sensor Auditory and Multipath Network. In 2019 International Conference on Automation, Computational and Technology Management (ICACTM) (pp. 469-472). IEEE. <https://doi.org/10.1109/ICACTM.2019.8776782>
- Mohril, R. S., Solanki, B. S., Lad, B. K., & Kulkarni, M. S. (2021). Blockchain Enabled Maintenance Management Framework for Military Equipment. *IEEE Transactions on Engineering Management*. <https://doi.org/10.1109/TEM.2021.3099437>
- Park, J., & Kang, H. (2020). DATA-DRIVEN DERIVATION OF PROMISING FUTURE DEFENSE TECHNOLOGY. *ICIC express letters. Part B, Applications: an international journal of research and surveys*, 11(12), 1195-1202. <https://doi.org/10.24507/icicelb.11.12.1195>
- Rastogi, A., Singh, R., Sharma, R., & Kalony, S. D. (2020). The survey of digital image analysis with artificial intelligence-DCNN technique. In 2020 9th International Conference System Modeling and Advancement in Research Trends (SMART) (pp. 209-211). IEEE. <https://doi.org/10.1109/SMART50582.2020.9337062>
- Vorm, E. S. (2020). Computer-centered humans: why human-AI interaction research will be critical to successful AI integration in the DoD. *IEEE Intelligent Systems*, 35(4), 112-116. <https://doi.org/10.1109/MIS.2020.3013133>