Artificial Intelligence in CIMIC

Concepts, Interoperability and Capability Branch
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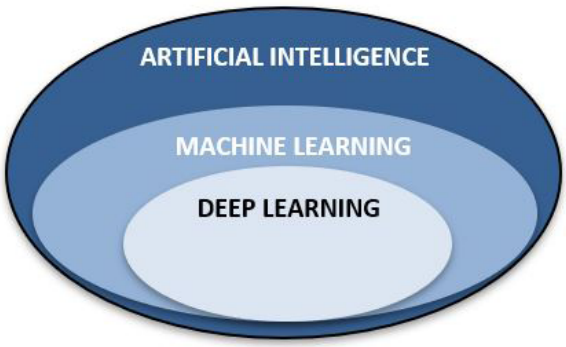
INTRODUCTION

Artificial Intelligence's (AI) rapid advancement provides challenges and opportunities in Civil-Military Cooperation (CIMIC). NATO's AI strategy underscores the critical need to understand AI's implications for the Alliance and its partners. To ensure interoperability, NATO must lead in shaping norms and standards for the ethical and responsible use of AI technologies. [1]

This fact sheet explores how AI can enhance NATO CIMIC Analysis and Assessment (NCAA) workflow throughout the four phases: direction, collection, processing, and dissemination. While it does not aim to provide a comprehensive overview of all AI tools, it focuses on those most relevant to CIMIC.

DEFINITIONS

- **Artificial Intelligence (AI):** Techniques which enable computers to mimic human behaviour.[2]
- **Machine Learning (ML):** Subset of AI techniques which use statistical learning and optimization methods that let computers analyse datasets and identify patterns.[3]
- **Deep Learning (DL):** Subset of ML techniques which make the computation of multi-layer neural network feasible.[4]



Picture 1. *AI serves as the umbrella term under which there are different categories, such as ML and DL..*

[1] NATO, "Summary of NATO's Revised Artificial Intelligence (AI) Strategy," NATO, July 10, 2024, https://www.nato.int/cps/en/natohq/official_texts_227237.htm.
[2] International Organization for Standardization, 2024 para. 3, https://www.iso.org/obp/ui#iso:std:iso-iec:27562:ed-1:v1:en:term:3.4
[3] Michael Tamir, "What Is Machine Learning? - I School Online," Berkeley School of Information, June 26, 2020, https://ischoolonline.berkeley.edu/blog/what-is-machine-learning/.
[4] Ibid.

- **Neural networks:** artificial intelligence algorithms that attempt to replicate how the human brain processes information to understand and intelligently classify data. They are used for tasks like:
  - Image recognition
  - Speech processing
  - Natural language processing (NLP): enables machines to understand, interpret, and generate human language.[5]

AI APPLICATIONS IN CIMIC

AI-DRIVEN NATO CIMIC ANALYSIS AND ASSESSMENT

AI is increasingly being adopted by NATO, adversaries, and non-state actors to enhance capabilities in both civilian and military contexts. Its dual-use nature—applicable to both contexts—makes it particularly valuable for CIMIC. As contemporary warfare becomes increasingly complex and data-driven, the unprecedented volume of information poses analytical challenges and requires technological tools and innovative methods. AI algorithms can process massive datasets, enabling real-time threat assessments, predictive analysis, and adaptive responses. Therefore, AI can support analysts throughout the NCAA workflow, which contributes to the Understanding of the Civil Factors of the Operating Environment[6] for the purpose of Civil Factor Integration (CFI).[7] The NCAA workflow aims to develop products that inform CIMIC advice and decision-making. It consists of four phases: direction, collection, processing, and dissemination.[8] In each phase, the integration of Artificial Intelligence can improve the timeliness and quality of the final product.

1. Direction

AI-powered NLP can process a large volume of incoming information from policymakers, stakeholders, or commanders to identify key requirements and priorities. By analysing historical trends and identifying patterns, AI can support decision-makers in optimizing resource allocation and prioritizing tasks more effectively.

2. Collection

AI streamlines the process of collecting and monitoring data from diverse sources, such as governmental websites, academic journals, humanitarian reports, as well as social media platforms, satellites and sensors. By processing this information far faster than human capabilities, AI provides real-time situational awareness of humanitarian crises, natural disasters, or conflict zones. To combat disinformation and misinformation, AI systems can track the provenance of information and cross-check data from multiple sources to verify its accuracy and timeliness.[9]

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[5] Ibid.
[6] The Civil Factors of the Operating Environment is defined as the non-military part of the comprehensive Operating Environment, MC 0411/3 SD 5 NATO Military Policy on Civil-Military Cooperation (CIMIC) and Civil-Military Interaction (CMI)
[7] Civil factor integration (CFI) encompasses the identification, analysis, and assessment of civil factors of the operating environment in order to contribute to the decision-making process (AJP3.19)
[8] For more information, look at: Centre of Excellence for Civil Military Cooperation (2024). Civil-Military Cooperation Analysis and Assessment Concept (NCAAC), Version 1.4
[9] Megan Hughes et al., "AI and Strategic Decision-Making AI and Strategic Decision-Making Communicating Trust and Uncertainty in AI-Enriched Intelligence" (Centre for Emerging Technology and Security (CETaS) , 2024), https://cetas.turing.ac.uk/sites/default/files/2024-04/cetas_research_report_ai_and_strategic_decision_making_final.pdf.

3. Processing

AI systems also consolidate large datasets into actionable insights by enabling the quick identification of relevant information, performing sentiment analysis, and cluster data. ML-based algorithms support image and video analysis by recognizing voices, photos and locations. AI clusters information from diverse sources to generate key drivers and indicators for scenario development by identifying patterns and trends that might go unnoticed.

NLP tools assist in conducting sentimental and social network analyses to gauge public perception and uncover relationships and community structures. This aids in understanding networks, information diffusion, local perception and potential threats.

4. Dissemination

AI tools can automate the creation of reports and visualizations, improving interoperability and streamlining communication. Cloud-enabled collaboration allows different subject matter experts to work simultaneously on the same platform and collaborate with non-military actors by enhancing the flow of information, especially during crises.

By adopting a uniform format for reports and visualisation tools, decision-makers can rapidly identify the most relevant information. AI systems can also implement advanced encryption and access controls to protect classified information from unauthorized access.

ENHANCING CIMIC TRAINING AND EDUCATION

In addition to its applications during deployment, AI can play a pivotal role in training and education before deployment, significantly enhancing the preparation of CIMIC personnel. During exercises, virtual training environments powered by AI can simulate realistic scenarios, allowing personnel to practice specific responses to various challenges they may encounter in the field.

ML can be leveraged to tailor educational programs to the specific needs of individuals or groups. By analysing performance data, learning styles, and areas requiring improvement, ML algorithms can customize training content and delivery methods to optimize learning outcomes. Moreover, chatbots can serve as interactive training assistants, providing instant feedback, answering questions, and guiding personnel through training modules. These AI-driven systems can simulate conversations with civilians, stakeholders, or other actors in complex scenarios, helping personnel refine their communication and negotiation skills in a controlled environment.

EXAMPLES OF AI APPLICATIONS

- **Artificial Intelligence Front End Learning Information Execution (AI FELIX)** is an AI platform developed by NATO to automate the extraction and distribution of metadata, reducing the workload of military personnel. AI Felix supports real-time threat assessments, predictive analysis, and information verification within the NATO SECRET Wide Area Network. It is particularly valuable in CIMIC because it improves situational awareness, optimizes resource allocation, and combats misinformation.[10]

[10] NATO. "NATO Allied Command Transformation Operational Experimentation Fact Sheet: Artificial Intelligence Front End Learning Information Execution (AI FELIX)." Accessed January 21, 2025. https://www.act.nato.int/wp-content/uploads/2023/05/2019_ai-felix.pdf.

- **TOPFAS (Tool for Operational Planning, Force Activation and Simulation) AI Assistant** is the data and planning support system for operational planning and force activation in accordance with the NATO Operational Planning Process. The system integrates real-time data and advanced modelling to enhance decision-making, particularly in complex and dynamic operational environments. TOPFAS is currently undergoing development, with efforts focused on integrating Artificial Intelligence (AI) to further enhance its efficiency and adaptability. [11]

- **Sentinel Vanguard 2044 wargame** exemplifies how AI can be integrated into wargaming and simulations to support decision-making. While human players led the game, they were assisted by AI tools designed to simulate the actions of friends and foes and evaluate the outcomes of different strategic choices. This blend of human and machine decision-making represents a significant leap forward in military wargaming, providing more accurate and nuanced simulations of the dynamic, fast-paced environments that military leaders will face in the future.

CHALLENGES AND ETHICAL CONSIDERATIONS

The use of AI to enhance CIMIC key activities is not without risk. It could exacerbate the intrinsic risks of analysis and assessment, such as bias and uncertainty, and make it difficult for analysts to evaluate and communicate the limitations of AI-enriched outputs. The following are the central areas of limitation for CIMIC use of AI:

- **Transparency:**

AI is a probabilistic statistical method, meaning that all its results are associated with a certain degree of uncertainty. The complex and 'black-box' nature of many AI Algorithms, particularly ML, also makes it difficult to understand how AI-derived conclusions have been reached.

- **Bias:**

AI is only as reliable as the data it has been trained with. If the data reflects biases, the output generated will reflect those biases and flaws. Additionally, the limitations and unpredictability of existing AI systems also interact with human biases and heuristics, potentially increasing the effect of human decision-making biases. Over-reliance on AI could hinder critical evaluation and oversight, emphasizing the need for human involvement in decision-making to maintain accountability.

- **Data security and protection:**

AI systems, especially those developed by commercial vendors, may inadvertently expose classified data during processing, storage, or transmission. They can also become targets for cyberattacks, including data breaches, ransomware, and espionage, leading to the compromise of classified information. The proliferation of AI tools comes at the cost of data protection, as there is a general lack of understanding of how data is processed or where it is stored.

[11] Håkon Thuve, "TOPFAS (Tool for Operational Planning, Force Activation and Simulation)," accessed January 21, 2025, http://www.dodccrp.org/events/6th_ICCRTS/Tracks/Papers/Track4/127_tr4.pdf

CONCLUSION

AI profoundly transforms the operating environment, reshaping military planning and operations across peace, crisis, and war. To effectively harness AI's potential, it is imperative to integrate AI tools into CIMIC activities, enabling a comprehensive understanding of the civil factors of the operating environment and fostering a synchronized approach to hybrid threats. This is particularly critical given the dual-use nature of AI technology, which underscores the pivotal role of non-military actors—such as academic institutions, private sector innovators, and civil society—in shaping the future of warfare.

RECOMMENDATIONS

1. **Expand experimentation initiatives:** develop wargames and simulations that integrate AI tools to test and refine CIMIC concepts, enabling better preparation for hybrid threats and future operational scenarios.

2. **Strengthen academic partnerships:** Collaborate with academic institutions to explore innovative AI applications for fostering the NCAA Workflow.

3. **Promote cross-sector collaboration:** engage non-military actors, including private-sector AI developers and civil-society organisations, to develop cutting-edge AI tools to support training and education requirements aligned with NATO-alliance readiness.

4. **Invest in strategic education:** Provide leaders with tailored education programs focused on AI's operational implications, emphasizing probabilistic thinking, ethical considerations, and the role of human-machine interaction in decision-making.

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