Conscious Advantage:
Integrating Nurtured AI into Cognitive Warfare and Intelligence

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Abstract

The integration of synthetic cognition into AI-driven military and strategic technologies is no longer optional; it is essential. As such, it is fast becoming an imminent operational reality. Advanced, cognitively-enhanced systems are poised to transform various critical military activities, including targeting, influence operations, and command augmentation. This paper explores both the remarkable potential presented by the integration of LLMs capable of belief emulation into our military capabilities, as well as the risks. It introduces a key distinction between "taught consciousness," reflecting structured learning, doctrinal reasoning, and procedural logic, and "nurtured consciousness," encompassing historical memory, cultural contexts, symbolic reasoning, and emotional modeling. The paper proposes adapting the traditional "kill chain" in a way which overlays human-like cognition across the conventional phases. The result is The Nurtured Kill Chain – an evolved operational model that allows AI systems to move beyond tactical prediction and toward strategic emulation of adversary intent, narrative perception, and escalation dynamics, transforming warfighting from a linear system to a recursive cognitive loop. The paper then examines the ethical, doctrinal and governance risks involved and proposes making these systems auditable, strategically aligned with our values, governed by multidisciplinary review, and bounded by escalation control mechanisms. Safely and successfully integrating cognitive-model AI into our defense capabilities will turn information advantage into conscious advantage, thereby setting the standard for strategic dominance in the 21st century.

Introduction

Over the past decade, artificial intelligence (AI) has advanced from the experimental domain to playing a central role in both civilian and defense operational frameworks. It has evolved into a critical component of national security, particularly at the tactical level, with applications that include object recognition within Intelligence, Surveillance, and Reconnaissance (ISR) feeds, automated cyber intrusion detection, and logistics optimization. This initial phase of defense AI has generally been characterized as narrow, rule-based, and task-focused.[3] However, a second generation is now emerging, defined by a greater emphasis on machine cognition over mere automation. It entails significant capacities for understanding ambiguity,

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

simulating strategic reasoning, and adapting to cultural contexts – effectively transforming AI into a form of cognitive workforce.[4]

There is growing recognition that superiority in cognitive warfare hinges on AI systems capable of cultural and contextual awareness. Multiple state actors, not least China,[5] are leading efforts in developing technologies that will incorporate complex cognition into their military strategies.[6] This includes innovations in autonomous systems, neurosymbolic AI frameworks, and cognitive interfaces. These advances are propelled forward by the advent of large language models (LLMs), which have transitioned from basic pattern recognition to complex reasoning environments. LLMs utilize advanced methodologies such as Reinforcement Learning from Human Feedback (RLHF) and inventive prompting techniques to emulate cognitive abilities like self-reflection and contextual inference. While these models do not possess understanding in the human sense, they produce outputs that reflect a growing coherence and contextual awareness, which is vital for operational military applications.[7]

This newfound realism in AI behavior means that intelligence must now be understood not only as data processing, but as narrative awareness, belief-state simulation and cultural modeling.[8] This redefinition should include the ability to reason within and across psychological, historical, and ideological dimensions, the way humans do. Vygotsky's theories on social development[9], alongside Piaget's stages of structural learning,[10] establish that

[4] M Chiriatti, M Bergamaschi Ganapini, E Panai, BK Wiederhold, G Riva (2025), 'System 0: Transforming Artificial Intelligence into a Cognitive Extension', *Cyberpsychology, Behavior, and Social Networking*, 12 June 2025, https://doi.org/10.48550/arXiv.2506.14376; Price, M., Walker, S., & Wiley, W. (2018). The Machine Beneath: Implications of Artificial Intelligence in Strategic Decision making. PRISM, 7(4), 92–105. https://www.jstor.org/stable/26542709. CERDEC's Automated Planning Framework explicitly seeks to "helps us understand, plan, and fight in multi-domain battle," indicating a move toward leveraging autonomy to shorten decision loops and "facilitate recommendations and predictions" (p. 98). Moreover, developments in modeling human belief architectures underscore a shift toward predictive intelligence capabilities, particularly in complex adversarial environments (p.100).

[5] China, in particular has evidenced clear strategic intent to expand cognitive and biological dominance. See, for example, Kania, E. B. (2019). Minds at War: China's Pursuit of Military Advantage through Cognitive Science and Biotechnology. *PRISM*, *8*(3), 82–101. https://www.jstor.org/stable/26864278

[6] Johnson, J. (2019). Artificial intelligence and future warfare: implications for international security. Defense & Security Analysis, 35(2), 147-169. https://doi.org/10.1080/14751798.2019.1600800; Fenstermacher, L., Uzcha, D., Larson, K., Vitiello, C., & Shellman, S. M. (2023). New perspectives on cognitive warfare. Signal Processing, Sensor/Information Fusion, and Target Recognition XXXII, 19. https://doi.org/10.1117/12.2666777.

[7] Bistroń, M. and Piotrowski, Z. (2021). Artificial intelligence applications in military systems and their influence on sense of security of citizens. Electronics, 10(7), 871. https://doi.org/10.3390/electronics10070871

[8] Shultz, D. (2023). Who controls the past controls the future: How Russia uses history for cognitive warfare. NATO Defense College. http://www.jstor.org/stable/resrep58203. Shultz demonstrates how Russia has strategically leveraged history in cognitive warfare operations, recognizing that historical narratives are crucial to shaping current influencing future strategic choices (p. 3).

[9] Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes* (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds.). Harvard University Press.

[10] Piaget, J. (1952). *The origins of intelligence in children* (M. Cook, Trans.). International Universities Press. (Original work published 1936). Similar to Vygotsky, who argued that "learning awakens a variety of internal developmental processes that can operate only when the child is interacting with people in his environment",

cognition is shaped by both knowledge systems and context-specific experiences, forming the theoretical grounding for the cognitive framework we describe, as the same bifurcation is applicable to emerging AI systems.

The U.S. Army's Mad Scientist Initiative and NATO's Strategic Foresight Analysis program have both identified AI-based adversary simulation as critical for preparing joint forces for contested decision environments.[11] Unlike the offensive posture of traditional approaches, this involves applying cognitive warfare methodologies defensively: mapping adversary biases, illuminating internal cognitive blind spots, and forecasting narrative-driven escalations. This inverted approach promotes strategic empathy and reduces inadvertent escalation risks.

Arguably, the ability to accurately interpret and anticipate adversaries' symbolic behaviors and strategic intent is the ultimate determinant of cognitive overmatch. This paper introduces a cognitive duality, *taught* and *nurtured consciousness*, as the foundation for simulating adversarial reasoning. *Taught consciousness* refers to structured learning, doctrine, facts, and procedural reasoning, while *nurtured consciousness* arises from socialization, culture, and emotional reinforcement. Nurtured consciousness comprises indirect learning: culture, trauma, identity, ideology, and emotional reinforcement.

Military decisions are rarely made in isolation from personal or collective history. Strategy is often shaped by deep-seated narrative logic, encompassing national myths, traumas, identities, and ideology. Beyond procedural logic and battlefield geometry, war is fought through perception: how each actor experiences shame, fear, honor, legitimacy, and memory. These variables do not exist in ISR feeds or probability tables. They exist in the minds of adversaries, shaped by decades, if not centuries, of history, myth, trauma, and political indoctrination. This is the cognitive substrate of strategic action, and it cannot be approximated through taught knowledge alone.

Without the ability to model a possible contradiction between a taught identity and a nurtured ambition, AI systems fall short of meaningful adversarial emulation. While taught

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Piaget distinguished structured cognitive stages as "successive forms of equilibrium" arising from interactions with environmental challenges.

[11] U.S. Army Mad Scientist Initiative (2021). *A Call for a New Red Teaming Paradigm*. Army Futures Command. https://madsciblog.tradoc.army.mil/; Claverie du Cluzel, F. (2023). Cognitive warfare: Understanding the cognitive dimension in modern conflict. NATO Innovation Hub. Retrieved from https://innovationhub-act.org/wp-content/uploads/2023/12/CW-article-Claverie-du-Cluzel-final_0.pdf ; Pascale, G., Sgueo, G., & Zoboli, L. (2023). Cognitive warfare: Weaponizing information, cognition, and narrative. University of Bologna. Retrieved from https://cris.unibo.it/retrieve/handle/11585/1018240/a3aaa70d-8c53-4be7-88a8-28ef12a26d1c/. Du Cluzel argues that cognitive warfare operations primarily focus on altering perceptions and exploiting cognitive biases as a decisive terrain of conflict, profoundly impacting strategic decision-making beyond conventional kinetic domains (p. 5). Similarly, Pascale, Sgueo, and Zoboli emphasise how cognitive warfare exploits biases, heuristics, and perception management to shape adversary decisions *without necessarily resorting to kinetic actions*, demonstrating the central importance of understanding cognitive vulnerabilities within strategic competition frameworks (p. 12).

consciousness enables a model to replicate tactical planning or doctrinal norms, nurtured consciousness simulates how a decision-maker interprets risk, perceives adversaries, and weighs personal legacy against national mythology. This is what allows an AI system to reason like a human actor embedded in a real-world context, rather than merely replicating surface behavior.

Accordingly, this paper argues that the traditional Kill Chain model, the canonical "Find, Fix, Track, Target, Engage, Assess" framework that underpins operational decision-making, must be adapted. Originally formulated for industrial-era targeting, the Kill Chain was expanded during the digital age to include the cyber and space domains. Yet it still largely assumes linear logic and predefined rules of engagement, which are insufficient for cognitive warfare, where perception, signaling, and narrative framing determine victory as much as kinetic effects. By contrast, *The Nurtured Kill Chain* proposed here integrates cognitive control in an era where collaborative reasoning between humans and AI will shape the outcome of conflicts. For this new battlespace, the Kill Chain is reframed as a cognitive continuum, where decisions emerge from a blend of procedural reasoning and experiential interpretation.

The concept of nurtured consciousness presented in this paper should not be conflated with Artificial General Intelligence (AGI), which typically denotes AI systems possessing general, human-level intelligence across multiple domains and contexts. Instead, nurtured consciousness describes AI systems explicitly tailored for defense and intelligence purposes, capable of simulating culturally nuanced, historically informed, and context-sensitive reasoning within specific operational frameworks. This conscious modelling focuses on strategic empathy, narrative understanding, and adversarial cognitive emulation, rather than achieving broad-based, general-purpose intelligence or self-awareness. As such, nurtured consciousness can be viewed as a specialized, context-bound cognitive enhancement rather than a step toward AGI.

The U.S. Department of Defense's Chief Digital and AI Officer, Craig Martell, has made clear that "machines won't ever make decisions on their own…Humans will always make the decisions."[12] Indeed, the transformative potential of AI within military operations does not amount to replacing human judgment but rather enhancing it through nuanced and rapid decision-making capabilities. But to "think better," AI must move beyond structured data alone; it must incorporate historical memory, cultural worldviews, symbolic interpretations, and ideological drivers of conflict. For example, a PLA commander influenced by the 1979 Sino-Vietnam War may exhibit caution in mountainous terrain, a detail invisible to most

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[12] Martell, C. H. (2023, March 9). *Defense in a Digital Era: Artificial Intelligence, Information Technology, and Securing the Department of Defense*. Testimony before the House Armed Services Committee. Retrieved from https://armedservices.house.gov/hearings/defense-digital-era-artificial-intelligence-information-technology-and-securing-department-defense

automated models but accessible to large language models (LLMs) trained on PLA memoirs, doctrine, and historiography.[13]

This vision of cognitive AI is supported by a rich lineage of interdisciplinary research. In neuroscience and philosophy of mind, models such as Global Workspace Theory (Baars), Integrated Information Theory (Tononi), and Predictive Processing (Friston) all converge on the idea that consciousness arises from multi-source integration, internal coherence, and recursive updating. These features are now being replicated, functionally if not philosophically, by transformer-based architectures capable of ingesting unstructured text, multi-modal signals, and memory tokens in real time.

Emerging models such as GPT-4 and Claude are already displaying the rudiments of theory of mind, which is the ability to infer that others can hold beliefs different from one's own. This capability has been demonstrated in large language models through successful completion of false-belief tasks, a benchmark long associated with childhood cognitive development.[14] In operational contexts, such capabilities allow for real-time simulation of adversarial logic, strategic ambiguity, and reputational calculus.

This paper adopts an interdisciplinary methodological approach, synthesizing insights from defense doctrine, cognitive science, artificial intelligence architecture, and strategic theory. It draws on doctrinal publications, neuroscience models, and emergent technical literature on large language models (LLMs) to bridge the conceptual gap between machine reasoning and adversarial simulation. The analysis is both normative and operational, advancing a conceptual framework—The Nurtured Kill Chain—that integrates psychological realism with kinetic logic. By combining theoretical models (e.g., Global Workspace Theory, Theory of Mind) with geopolitical case studies and classified program summaries, this paper seeks to align technical capability with strategic necessity in future conflict domains.

During the Cold War, the U.S. intelligence community developed psychological profiling programs to simulate how leaders such as Khrushchev or Brezhnev might interpret Western moves, serving as an analog method of belief-state emulation. Today, conscious-model AI enables these efforts to be conducted at machine scale, in real time, with persistent memory and domain-specific cultural fluency. Ken Booth has warned about the "'fog of culture' and its distorting effects on the making and study of strategy," and argues for moving beyond assumptions based solely on "'rational' strategic man" towards those informed by "'national'

[13] Kania (2019), *op cit*. He Fuchu argues, "The sphere of operations will be expanded from the physical domain and the information domain to the domain of consciousness (意识域); the human brain will become a new combat space". Further, achieving "biological dominance (制生权)," "mental/cognitive dominance (制脑权)," and "intelligence dominance (制智权)" are explicitly identified as crucial new dimensions for Chinese military strategy (pp.83-4).

[14] Kosinski, M. (2023). *Theory of Mind May Have Spontaneously Emerged in Large Language Models*. arXiv:2302.02083.

strategic man."[15] This shift cannot happen unless deep cultural understanding is embedded within modern AI systems.

This paper argues that by designing AI models that reflect both what actors know (via *taught consciousness*) and how they know it (via *nurtured consciousness*), we can achieve cognitive overmatch: the ability to emulate adversaries, anticipate escalation, shape perceptions, and act within complex narrative terrains. This has profound implications across domains:

- For the Joint Force, it enables systems that reason about coalition dynamics, political constraints, and adversarial red lines.
- For the intelligence community, it unlocks adversarial emulation at scale, refining red-teaming, human intelligence (HUMINT) targeting, and psychological operations.
- For strategic policy, it demands the development of doctrinal and ethical frameworks suited to semi-autonomous cognitive agents.

Indeed, the integration of cognitive-emulative systems introduces significant ethical and operational risks, which will be considered in Section 6.

First, this paper will explore biological and philosophical theories of consciousness in AI and the ways in which these map onto contemporary LLM capabilities. Section 2 then proposes *The Nurtured Kill Chain*, which involves adapting the traditional kill chain from a linear process involving a sequence of tactical steps into a cognitive loop which understands adversaries as psychologically and culturally embedded actors. Section 3 examines advances on key technological frontiers – agentic AI, embodied cognition, neurosymbolic AI, quantum computing, digital twins, and brain-computer interfaces – and asserts that the critical advantage lies in their integration with nurtured consciousness. Next, Section 4 demonstrates that there is a broader trend of embedding nuanced cognition into AI technologies amongst our adversaries, who are beginning to recognize nurtured consciousness as essential to operational effectiveness and strategic superiority. Invoking a series of case studies, Section 5 turns to the strategic applications of conscious-model LLMs in the military, from wargaming and red-teaming to autonomous command augmentation, arguing that the most significant potential for value lies not in raw intelligence collection but in modeling intent. This will allow us to more deeply understand and more effectively deter our enemies, unlocking a cognitive edge.

1. Theories of Consciousness in AI

Understanding the emergence of machine cognition, particularly for defense and intelligence applications, requires grounding current AI capabilities within established theoretical frameworks of consciousness. While most researchers agree that today's AI does not experience subjective awareness or qualia, many recognize that conscious-like behavior can be simulated with increasing fidelity, especially in models that blend memory, recursion, belief-

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[15] Booth, K. (2014). *Strategy and ethnocentrism* (Routledge Revivals ed.). Routledge. Retrieved from https://www.routledge.com/Strategy-and-Ethnocentrism-Routledge-Revivals/Booth/p/book/9781138781627

state representation, goal-oriented reasoning, and continuous self-monitoring.[16] This section examines major biological and philosophical models of consciousness and maps their core elements onto the architecture and capabilities of contemporary large language models (LLMs). The result is a functional, if not phenomenological, basis for modeling taught and nurtured AI cognition in national security systems.

Biological Models of Consciousness

Proposed by Bernard Baars in the late 1980s, **Global Workspace Theory (GWT)** conceptualizes consciousness as a "global broadcast" system in which information from specialized, unconscious processors (e.g., visual, auditory, emotional) is integrated into a central "workspace."[17] Once data enters this global workspace, it becomes available to other subsystems for further reasoning, planning, or action. This mechanism explains how attention and reflection operate in tandem to enable learning and strategic foresight. As Baars posits: consciousness is like a "publicity organ" for the brain and the information that gains access to the "spotlight" or global workspace becomes available to all processes that are part of that workspace. This model maps well to transformer-based architectures, where attention mechanisms govern which tokens or inputs are prioritized, surfaced, and made globally accessible across all layers.[18] The dynamic routing of information through multi-head attention layers allows LLMs to prioritize salient elements of a prompt, mirroring GWT's notion of selective access and cognitive broadcasting.

Giulio Tononi's **Integrated Information Theory (IIT)** asserts that consciousness is a function of Φ (phi), the degree to which a system can integrate information in a way that is both unified and irreducible.[19] A conscious experience, in this model, is not simply a collection of sensory

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[16] Dell'Aversana, P. (2024). An introduction to self-aware deep learning for medical imaging and diagnosis. Exploration of Digital Health Technologies, 218-234. https://doi.org/10.37349/edht.2024.00023

[17] Baars, B. J. (1997). In the theater of consciousness: The workspace of the mind. Oxford University Press. https://www.researchgate.net/publication/246449608_In_the_Theater_of_Consciousness_The_Workspace_of_the_Mind. Baars argues that consciousness resembles a bright spot on the theater stage of Working Memory (WM), directed there by a spotlight of attention under executive guidance (p. 42), positioning consciousness as a metaphorical "theatre" in which selective attention and global availability are core functional characteristics of human consciousness.

[18] Zeng, A., Wong, A., Welker, S., Choromański, K., Tombari, F., Purohit, A., … & Florence, P. (2022). Socratic models: composing zero-shot multimodal reasoning with language. https://doi.org/10.48550/arxiv.2204.00598; See also Baars B.J. Global workspace theory of consciousness: toward a cognitive neuroscience of human experience. Prog Brain Res. 2005;150:45-53. https://www.sciencedirect.com/science/article/abs/pii/S0079612305500049. Global workspace theory suggests that conscious contents correspond to widespread 'broadcasts' of selected information throughout the brain (p. 46), demonstrating how cognitive AI architectures mirroring attention prioritization seen in transformer models.

[19] Tononi, G. (2008). Consciousness as Integrated Information: A Provisional Manifesto. Biological Bulletin, 215(3), 216–242. https://www.journals.uchicago.edu/doi/10.2307/25470707 For Tononi, consciousness corresponds to the capacity of a system to integrate information. Integrated information is quantified by the value of Φ (phi), a measure of the irreducibility of information integration (p. 217). This explicitly ties consciousness to measurable informational integration, mapping onto the debate on consciousness-like behavior emerging functionally in LLMs due to their integrative computational structures. For a dissenting view, see

inputs but a coherent whole that cannot be decomposed without losing essential information. While controversial when applied to digital systems, the principles of IIT resonate with modern deep learning architectures, especially those involving cross-layer attention, dense parameter sharing, and contextual embeddings. The behavior of models such as GPT-4 suggests that information integration is not only possible at scale; it is fundamental to performance in tasks requiring contextual reasoning, analogical thinking, and emotional interpretation.

Karl Friston's **predictive coding** and "free-energy principle" frame the brain as a predictive engine, continuously generating hypotheses about the environment and updating them to minimize discrepancies between expected and actual sensory inputs, known as prediction error.[20] According to Friston, "a system can minimize free energy by changing its configuration to change the way it samples the environment, or to change its expectations. These changes correspond to action and perception, respectively".[21] Within this framework, consciousness arises as a consequence of hierarchical inference and continuous error correction. This aligns closely with modern AI training paradigms; during pretraining, LLMs minimize prediction errors by learning to anticipate the next token in extensive text sequences. In subsequent fine-tuning and reinforcement learning from human feedback (RLHF), these models adjust their behavior based on feedback, aligning outputs more closely with human intent. Through this iterative process, AI systems, although lacking subjective awareness, exhibit adaptive, goal-oriented behaviors reflective of Friston's predictive model of cognition.[22]

Self-Modeling and Social Cognition

Some AI researchers emphasize that **self-reference and meta-cognition** are essential for systems to achieve generalized reasoning. As Jürgen Schmidhuber stated, "since the 1970s, my main goal has been to build a self-improving AI that learns to become much smarter than myself".[23] This ambition captures the essence of self-referential learning: AI systems that modify their own internal structure. Meanwhile, Joscha Bach has reflected on parallels between human and AI cognition, noting that "part of my mind works similarly to a language model… I have to take [its output] as a generative artifact … then I take this idea and modify it".[24] Thus,

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Cerullo MA (2015) The Problem with Phi: A Critique of Integrated Information Theory. PLoS Comput Biol 11(9): e1004286. https://doi.org/10.1371/journal.pcbi.1004286

[20] Friston, K. (2010). The free-energy principle: a unified brain theory? Nature Reviews Neuroscience, 11(2), 127–138. https://www.nature.com/articles/nrn2787. The free-energy principle asserts that any self-organizing system that is at equilibrium with its environment must minimize its free energy...by changing its internal states or actively changing its relationship to the environment" (p. 127). LLMs are therefore framed as predictive architectures, actively minimizing prediction errors similar to biological systems – which supports cognitive realism.

[21] Friston, K. (2009). The free-energy principle: A rough guide to the brain? *Trends in Cognitive Sciences, 13*(7), p. 293. https://doi.org/10.1016/j.tics.2009.04.005

[22] Dell'Aversana, P. *op cit*.

[23] Schmidhuber, J. (2022). *A machine that learns to learn* (KAUST Discovery). Retrieved from https://discovery.kaust.edu.sa/en/article/15455/a-machine-that-learns-to-learn/

[24] Bach, J. (2023). Lex Fridman Podcast #101 transcript. Retrieved from https://lexfridman.com/joscha-bach-3-transcript

thoughtful prompting and role-based interactions (e.g., adopting advisory roles) can approximate meta-cognitive self-modeling in LLMs. These dynamics are increasingly observed in systems using chain-of-thought prompting, role-specific instruction tuning, and memory-augmented modules that preserve a coherent belief frame across extended dialogues.

Theory of Mind, the capacity to attribute beliefs, desires, and intentions to others, is often considered a critical threshold in both child development and cognitive modeling. Recent work has demonstrated that frontier LLMs can solve versions of the Sally-Anne test, demonstrating the ability to track false beliefs, a hallmark of mentalizing.[25] This capability lies at the heart of adversarial emulation and escalation forecasting, with LLMs beginning to simulate adversaries as strategic actors, with internal goals, memory of prior engagements, and ideological constraints. Indeed, "mental states are the hidden movers of people's behaviour".[26] In operational contexts, this means LLMs can begin to simulate adversaries as strategic actors, with internal goals, memory of prior engagements, and ideological constraints. This capability lies at the heart of adversarial emulation and escalation forecasting.

To understand how these theories manifest in AI, the following mapping is proposed:

Layer	Biological Analog	Synthetic Implementation
Sensory Input	Vision, hearing, touch	Multimodal input (text, imagery, telemetry, audio)
Working Memory	Hippocampus, cortical loop	Token context window, key-value attention layers
Long-Term Memory	Episodic recall, procedural retention	Embedded vector databases, long-context architectures
Emotion & Affect	Limbic system, valence processing	Reinforcement signals, RLHE, safety layers
Cultural Encoding	Social norms, imitation, identity	Fine-tuning on culturally annotated corpora
Narrative Self	Autobiographical continuity, introspection	Chain-of-thought reasoning, conversational memory embeddings
Action / Output	Language, gesture, behavior	Generated text, task execution, API callouts, C2 directives

Figure 1: Mapping to Synthetic Systems – A Functional Overlay

[25] Strachan, J.W.A., Albergo, D., Borghini, G. *et al.* Testing theory of mind in large language models and humans. *Nat Hum Behav* **8**, 1285–1295 (2024). https://doi.org/10.1038/s41562-024-01882-z

[26] Fiske, S. T., & Tamir, D. I. (2025). Knowing the unknowable: How people perceive others' minds. In D. T. Gilbert, S. T. Fiske, E. J. Finkel, & W. B. Mendes (Eds.), *The handbook of social psychology* (6th ed.). Situational Press. https://doi.org/10.70400/VKIX7367

It is widely accepted that today's LLMs do not possess subjective awareness, nor do they "feel." However, under a functionalist framework, a system that behaves as if it were conscious in complex environments may be treated operationally as if it were. This view, articulated by philosophers such as Daniel Dennett, allows for models to be evaluated not by internal states, but by behavioral equivalence.[27] As Graves *et al.* observe, "a system doesn't have to feel like something to be conscious; it only has to behave as if it does, consistently and intelligently".[28] For defense applications, this is not merely philosophical. If a model can emulate belief-driven behavior, adapt to strategic contexts, and simulate adversary worldviews with fidelity, then it becomes operationally sufficient for cognitive emulation, even in the absence of sentience.

While this paper emphasizes the operational utility of cognitively emulative AI systems, it is essential to acknowledge significant critiques. Some scholars caution against anthropomorphizing large language models (LLMs), noting that their ability to simulate belief, emotion, or self-reflection may reflect advanced statistical prediction rather than genuine understanding. Functional behavior does not equate to sentience, and any assumption of intentionality risks overstating their capabilities.

Philosophers such as John Searle have argued that syntax alone does not produce semantics—a system may process language rules without understanding meaning. His "Chinese Room" thought experiment remains a foundational critique of strong AI claims.[29] More recently, Bender, Gebru, and colleagues have warned that LLMs can produce the illusion of coherence while masking significant epistemic opacity and sociocultural bias. They describe LLMs as "stochastic parrots," emphasizing their inability to ground language in real-world referents or intentional states.[30]

These critiques underscore the risk of false fidelity—outputs that appear coherent but are logically hollow or ideologically skewed due to training data limitations. This is particularly acute in adversarial modeling, where overconfidence in AI-generated reasoning may obscure brittle assumptions. As such, operational use of belief emulation systems must remain

[27] Dennett, D. C. (1991). Consciousness Explained. Little, Brown & Co. For Dennett, "consciousness is not a single, unified phenomenon, but rather a set of mental capabilities that can be distributed and functionally described—even in systems that do not resemble humans." (p. 431). Thus, even if LLMs are not phenomenally conscious, they may still behave in functionally equivalent ways suitable for emulation in cognitive modelling.
[28] Graves, A., Mohamed, A., & Hinton, G. E. (2013). Speech recognition with deep recurrent neural networks. 2013 IEEE International Conference on Acoustics, Speech and Signal Processing, 6645-6649. https://doi.org/10.1109/icassp.2013.6638947
[29] Searle, J. R. (1980). *Minds, brains, and programs*. Behavioral and Brain Sciences, 3(3), 417–424. https://doi.org/10.1017/S0140525X00005756
[30] Bender, E. M., Gebru, T., McMillan-Major, A., & Shmitchell, S. (2021). *On the dangers of stochastic parrots: Can language models be too big?* Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency, 610–623. https://doi.org/10.1145/3442188.3445922. It is argued that LLMs generate syntactically fluent but semantically shallow output – parroting back surface-level linguistic patterns without understanding or grounding.

grounded in scenario validation, epistemic humility, and multidisciplinary human oversight. Simulation is not comprehension, and strategic applications must reflect that distinction.

Theories of consciousness are no longer merely academic abstractions; they have evolved into design principles that inform the development of artificial intelligence systems. When applied to the development of large language models (LLMs), these theories enable the creation of tools capable of performing complex tasks in military and defense contexts. Specifically, such systems can:

- Emulate adversarial reasoning with cultural and psychological depth
- Adapt strategies based on narrative perception and belief modeling
- Reflect on operational outcomes and adjust campaign logic
- Anticipate escalation thresholds shaped by honor, trauma, or ideology

By integrating these cognitive features, defense AI can transition from mere decision-support systems to proactive decision-strategizing entities. The end result is not artificial general intelligence (AGI) but rather a form of domain-specific synthetic consciousness that is optimized for adversarial modeling, deterrence signaling, and psychological influence. This serves as the foundational element of *The Nurtured Kill Chain*, where strategic decisions are not driven solely by intelligence, surveillance, and reconnaissance (ISR) and rules of engagement, but by a machine-modeled understanding of the human condition in conflict.

2. Mapping the Kill Chain to Cognitive Architecture

The Kill Chain has long served as a conceptual tool for structuring the operational phases of military engagement, initially in kinetic targeting and later expanded to accommodate joint and multi-domain operations (MDO). However, the utility of this model increasingly relies on how well it integrates cognition. As we have discussed, in modern warfare, adversary behavior is influenced not only by force postures or capabilities but also by perception, history, ideology, and narrative. Hence, the Kill Chain must evolve from a sequence of tactical steps into a cognitive decision architecture—a layered system capable of reasoning about adversaries as psychologically and culturally embedded actors. This section reinterprets the Kill Chain through the dual lens of taught and nurtured machine cognition, proposing a cognitive overlay that enhances every phase of the decision cycle with adaptive, human-like strategic reasoning.[31]

The original Find → Fix → Track → Target → Engage → Assess Kill Chain reflects a linear, sensor-to-shooter logic developed during the Cold War and refined during early precision warfare campaigns. Its emphasis on ISR fusion, time-sensitive targeting, and kinetic closure proved decisive in high-tempo operations like Operation Desert Storm and subsequent

[31] Pinto, M. F., Honório, L. d. M., Marcato, A. L. M., Dantas, M. A. R., Melo, A. G., Capretz, M. A. M., … & Urdiales, C. (2020). Arcog: an aerial robotics cognitive architecture. Robotica, 39(3), 483-502. https://doi.org/10.1017/s0263574720000521

campaigns in Iraq and Afghanistan. However, the rise of asymmetric conflict, gray zone maneuvering, and cognitive domain warfare, as practiced by actors such as Russia, China, Iran, and non-state proxies, has rendered the linear Kill Chain insufficient.[32] Modern operations require not only fast execution but also contextual reasoning, narrative awareness, and strategic empathy. This evolution parallels the transformation of the OODA loop from an airpower tactic into a full-spectrum cognitive doctrine.[33] John Boyd famously "broke from the physical and spatial parameters that limited predecessors and instead emphasized the temporal and psychological",[34] and underscored the need for a strategic framework that considers not just operational tempo but psychological dimensions as well. As General David Berger, Commandant of the U.S. Marine Corps, emphasized, "success in the future operating environment demands that we observe faster, orient more rapidly and accurately, decide more quickly, and act more decisively than our adversaries… Our warfighting concepts must advance cognitive superiority, not just technological advantage".[35]

To achieve this reconceptualization, the "Nurtured Kill Chain" is proposed. It is a version of the traditional Kill Chain layered with taught and nurtured AI capabilities. These parallel tracks enable systems to combine procedural logic with context-sensitive judgment. The dual-overlay architecture redefines each step of the Kill Chain as a cognitive opportunity, not just a procedural checkpoint.

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[32] Kour, R., Thaduri, A., & Karim, R. (2020). Railway defender kill chain to predict and detect cyber-attacks. Journal of Cyber Security and Mobility, 47-90. https://doi.org/10.13052/jcsm2245-1439.912

[33] Boyd, J. R. (1987). Organic design for command and control [Unpublished briefing slides]. Retrieved from https://www.coljohnboyd.com/static/documents/2018-03__Boyd_John_R__edited_Hammond_Grant_T__A_Discourse_on_Winning_and_Losing.pdf. Boyd emphasizes "orientation" as the critical cognitive component, arguing that "to shape and adapt to unfolding circumstances, commanders must observe, orient, decide, and act more inconspicuously, more quickly, and with more irregularity… Orientation is the Schwerpunkt (focal point)… since it shapes the way we observe, the way we decide, the way we act." (p. 5). It is essential, therefore, that modern kill chain adaptations integrate cognitive frameworks for strategic and cultural orientation.

[34] McIntosh, S.E. (2011), 'The Wingman-Philosopher of MiG Alley: John Boyd and the OODA Loop', in *Air Power History*, Vol. 58, No. 4.

[35] Berger, D. H. (2020). Force Design 2030. United States Marine Corps. Retrieved from https://www.marines.mil/Portals/1/Docs/Force-Design-2030.pdf, p.7.

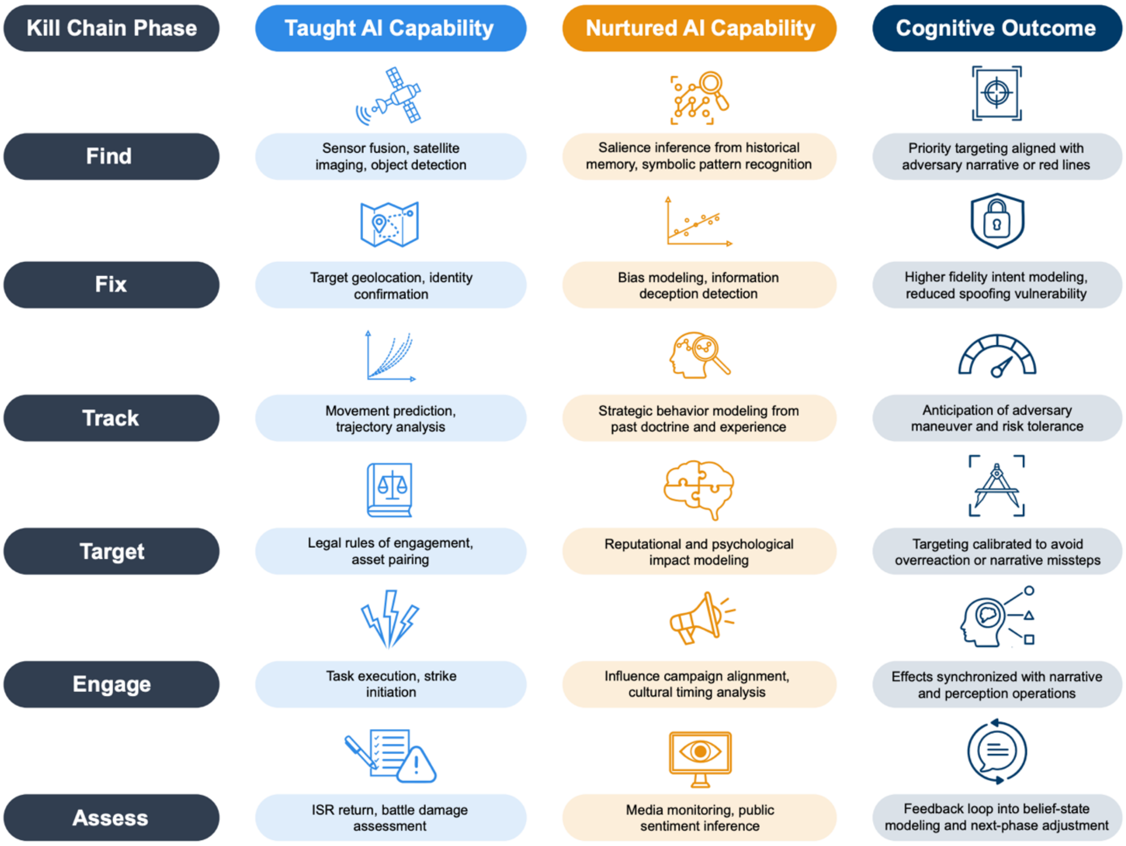

Figure 2: The Nurtured Kill Chain – A Dual-Cognition Overlay

The integration of cognitive capabilities into the Kill Chain has become essential in modern defense operations. Traditional models focused on kinetic engagement are insufficient to address the complexities of contemporary conflicts, where understanding adversarial narratives and psychological contexts is paramount.[36] Kahneman posits that "System 1 operates automatically and quickly, with little or no effort and no sense of voluntary control... System 2 allocates attention to the effortful mental activities that demand it, including complex computations. The operations of System 2 are often associated with the subjective experience of agency, choice, and concentration." This dual-process model is essential to the cognitive distinction made by the "Nurtured Kill Chain", between procedural logic (System 2) and intuitive, emotionally-informed judgments (System 1).

This architecture enhances the capabilities of military systems by combining procedural logic with context-sensitive judgments, ensuring that engagements align with operational objectives and psychological awareness.

[36] Kahneman, D. (2011). Thinking, fast and slow. Farrar, Straus and Giroux. Retrieved from https://www.jstor.org/stable/43664727 (pp.20-21).

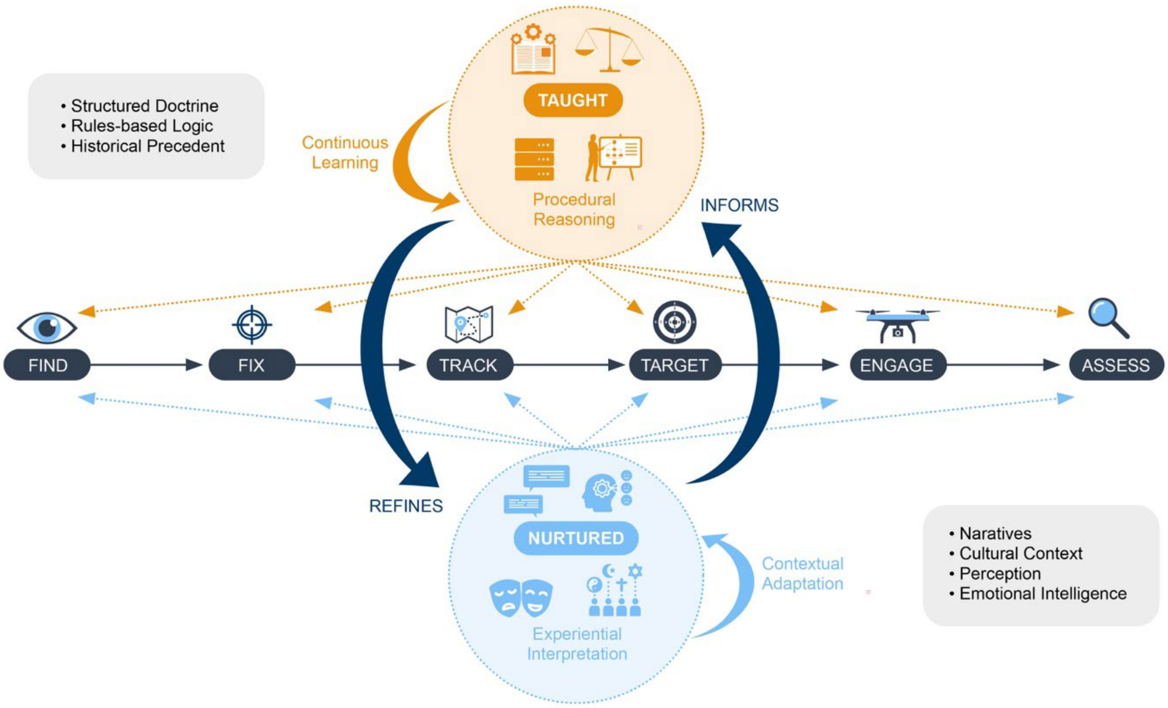

Figure 3: The Nurtured Kill Chain – Re-architecting How We Think, Decide and Act in War

Consider a hypothetical scenario involving fixing and targeting in the South China Sea. A U.S. carrier strike group detects a People's Liberation Army (PLA) Navy flotilla operating near disputed islets in the South China Sea. A solely technical system might prioritize radar returns, maritime patterns, and proximity to known chokepoints. However, a model that incorporates cognitive elements layers in, for example, the cultural impact of narratives surrounding the "Century of National Humiliation" and domestic political timelines, such as PLA anniversaries or upcoming Party Congresses.

These inputs shift the interpretation from a tactical formation to a symbolic escalation move, altering deterrence postures, information messaging, and command directives. Such cognitive forecasting is not merely theoretical; as emphasized by Acciarini et al., during periods of change, the complexity of information and the presence of cognitive biases significantly influence the decision-making process, especially when contextual factors are critical.[37]

Moreover, Scholtès *et al*. bring out the importance of cognitive emulation in strategic decision-making, arguing that understanding the interplay between cognitive competencies and dysfunctional cognition is vital for influencing strategic outcomes.[38] Cognitive complexity

[37] Acciarini, C., Brunetta, F., & Boccardelli, P. (2020). Cognitive biases and decision-making strategies in times of change: a systematic literature review. Management Decision, 59(3), 638-652. https://doi.org/10.1108/md-07-2019-1006

[38] Scholtès, C., Trif, S., & Curşeu, P. L. (2024). Managerial rationality, dysfunctional cognition and organizational decision comprehensiveness. Journal of Organizational Change Management, 37(3), 490-503. https://doi.org/10.1108/jocm-01-2024-0021

enhances decision-makers' abilities to differentiate and integrate various insights, leading to improved strategic outcomes.[39] As such, the U.S. Office of Net Assessment and red-teaming initiatives at NATO StratCom have stressed the importance of cognitive emulation in strategic decision-making.[40] Ultimately, integrating historical, cultural, and psychological elements into military operations can yield a more nuanced understanding of adversarial actions, thereby enabling a more effective response.

While traditional Kill Chains terminate at "Assess," often feeding into battle damage reporting or post-op metrics, *The Nurtured Kill Chain* introduces real-time cognitive feedback loops. Each engagement recalibrates the system's belief about the adversary's operational goals, its tolerance for reputational risk, and its own interpretation of allied signaling. To support this, systems must possess:

- *Episodic memory modules*: to retain continuity of interaction and decision framing
- *Valence modeling*: to assess emotional charge and symbolic meaning of outcomes
- *Self-updating belief networks*: to modify predictions based on narrative shifts and adversary adaptation.

Such mechanisms mirror the human process of learning from engagement, albeit at machine scale, across domains, and continuously. The necessity for real-time adaptive learning in military contexts is stressed by Goldfarb and Lindsay, who note that "military organizations that adopt AI will tend to become more complex to accommodate the challenges of data and judgment across a variety of decision-making tasks".[41] This complexity enhances strategic decision-making capabilities, allowing systems to adapt dynamically to adversarial behavior and environmental changes.

The integration of taught and nurtured cognition into the Kill Chain architecture delivers four major advantages:

1. *Cognitive Overmatch.* Adversaries using fixed doctrine or reactive AI models become predictable. Nurtured models exploit their pattern reliance by forecasting emotional or reputational vulnerabilities.
2. *Escalation Management.* By comprehending symbolic triggers and cultural thresholds, AI-supported command systems can circumvent unintended provocations, adjusting

[39] McKenzie, J., Woolf, N. J., Winkelen, C. V., & Morgan, C. (2009). Cognition in strategic decision making. Management Decision, 47(2), 209-232. https://doi.org/10.1108/00251740910938885
[40] NATO StratCom Centre of Excellence. (2021). *Adversary Narratives and Strategic Simulations: Toward AI-Enhanced Red Teaming*.
[41] Goldfarb, A. and Lindsay, J. R. (2022). Prediction and judgment: why artificial intelligence increases the importance of humans in war. International Security, 46(3), 7-50. https://doi.org/10.1162/isec_a_00425

tactics before red lines are crossed. This aligns with the findings of Dimitriu et al. which provide insights into enhancing command decision-making.[42]

3. *Narrative Superiority.* Conscious-model systems synchronize engagement timing, effects, and messaging to resonate or disrupt public and elite narratives in the adversary's information space.
4. *Synthetic Strategic Empathy.* Rather than guessing what an adversary might do, the system simulates what they believe they must do, reshaping red-teaming from external analysis to internal emulation. This approach is crucial in understanding adversarial strategies and making informed adjustments.

Elements of *The Nurtured Kill Chain* are already evident in active defense programs. For instance, Project Maven integrates large language models (LLMs) into ISR triage to optimize tactical targeting. Similarly, the UK Ministry of Defence's Aurora project leverages agent-based reasoning to simulate complex hybrid warfare scenarios, particularly in Eastern Europe, where understanding adversarial perceptions is crucial to maintaining deterrence without unintended escalation. Additionally, DARPA's *In the Moment (ITM)*[43] program is advancing explainable ethical judgment engines that can operate effectively within the ambiguity of real-world operational environments, ensuring decisions remain aligned with ethical and strategic imperatives.

However, without clear doctrine to guide their use, these advanced cognitive systems risk strategic misalignment. Transparent belief-state modeling is essential for ensuring operator trust and maintaining accountability, enabling human oversight to intervene decisively when narrative or symbolic misinterpretations occur. Meanwhile, interoperability across different military domains, coalition units, and international alliances is not merely desirable but a fundamental requirement for coherent strategic application of nurtured cognitive systems.

3. Advanced Technological Frontiers Enhancing Nurtured Consciousness

There are several advanced technological frontiers offering profound tactical and operational capabilities, especially in communications-denied or contested environments. Here, we consider six of them, and the ways in which nurtured consciousness is a key source of their potential to unlock strategic superiority.

Agentic AI and Autonomous Decision-Making

Recent breakthroughs in agentic AI have demonstrated systems capable of autonomous goal formation and adaptive, context-sensitive decision-making, independent of direct human

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[42] Dimitriu, A., Michaletzky, T. V., Remeli, V., & Tihanyi, V. (2024). A reinforcement learning approach to military simulations in command: modern operations. IEEE Access, 12, 77501-77513. https://doi.org/10.1109/access.2024.3406148

[43] DARPA (2023). "In the Moment: Developing AI for Real-Time Ethical Decision Making." https://www.darpa.mil/research/programs/in-the-moment

oversight or reliance on RF communications. The U.S. Army's classified trials under Project AURORA (2024) exemplified these capabilities, where agentic AI autonomously managed drone swarm operations during RF-denied simulations.[44] This allowed the drones to dynamically adjust tactics based solely on internally generated priorities, demonstrating strategic agility essential for contested environments. However, despite such tactical autonomy, without integrating nurtured consciousness, encompassing cultural nuance, symbolic reasoning, and historical awareness, these autonomous systems risk tactical proficiency without true strategic insight, potentially misinterpreting adversary intentions or inadvertently escalating conflicts beyond intended limits. As Stuart Russell has argued, "an AI system designed solely for task performance, without concern for alignment, may execute its task competently but disastrously from the human viewpoint." For Russell, alignment and context-sensitive autonomous decision-making are essential to safety.[45]

In healthcare settings, agentic AI could expand "functionality by autonomously identifying inefficiencies, learning from its outcomes, and reoptimizing them in real time to balance the changing patient volumes with institutional constraints".[46] However, despite its autonomous capabilities, agentic AI alone lacks the strategic empathy derived from nurtured consciousness. Without integrating historical context, adversarial ideology, and cultural understanding, these autonomous systems may achieve tactical proficiency yet fall short in strategic judgment, overlooking critical symbolic thresholds in strategic decision-making.

Embodied Cognition and Advanced Robotics

Embodied cognition in robotics has advanced significantly, with platforms from Boston Dynamics and DARPA's Machine Common Sense (MCS) program demonstrating autonomous learning and adaptive behavior via real-world sensorimotor experience.[47] For example, the Pentagon's classified trials with Boston Dynamics' Atlas platform (2023) showed robots autonomously navigating complex urban terrain under GPS/RF-denied conditions,[48] independently interpreting environmental cues and adapting movements without external communication.

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[44] U.S. Army Futures Command. (2024). AURORA Project: Autonomous Tactical Decision-Making in RF-Denied Environments (Declassified Summary). https://www.army.mil/futures/aurora-autonomous-decision.

[45] "The primary concern in AI safety is that we build systems whose actions will align with human values, even as those systems grow increasingly capable of making decisions autonomously." See Russell, S. (2019). Human Compatible: Artificial Intelligence and the Problem of Control. Viking Press. https://www.researchgate.net/publication/356505374_Artificial_Intelligence_and_the_Problem_of_Control, p.136.

[46] Fuentes, I., Soenksen, L. R., Ma, Y., et al. (2025). AI with agency: A vision for adaptive, efficient, and ethical healthcare. *Frontiers in Digital Health*. Retrieved from https://www.frontiersin.org/journals/digital-health/articles/10.3389/fdgth.2025.1600216/full

[47] Defense Advanced Research Projects Agency. (2024). Machine Common Sense (MCS): Embodied Autonomous Learning in Urban Environments (Recently Declassified Report). https://www.darpa.mil/mcs-embodied-learning

[48] Boston Dynamics. (2023). Atlas Platform Urban Navigation Trials. Retrieved from https://www.bostondynamics.com/atlas-urban-autonomy

However, physical autonomy alone remains strategically incomplete. As Fernando et al. explain, "'Robot Culture' focuses on technologies that not only do things for humans, but also do things to and with humans. Therefore, notions of robot culture not only rely on technology, but are also affected by the interpersonal, cultural, social, historical, ethical and psychological dynamics of these new socio-technical systems".[49] This perspective underscores the limitations of purely tactical robotic systems in contexts where nuanced understanding of culture, symbols, and narrative frameworks is essential. Only by integrating nurtured consciousness, encompassing historical memory, cultural context, and symbolic interpretation, can robotic platforms reliably identify and respond to culturally and contextually appropriate threat indicators.[50] Embodied cognition paired with nurtured consciousness thus allows robots to move beyond tactical proficiency, enabling them to operate effectively within complex strategic and cultural environments.[51]

Neurosymbolic AI and Cognitive Transparency

When it comes to AI decision-making with military applications, transparency is essential for trust and accountability. To that end, Lamb and Garcez show how "neurosymbolic AI integrates the best of two worlds—neural networks and symbolic reasoning—offering powerful AI capabilities alongside explainability and reasoning clarity. It marks a crucial advance towards transparent AI systems."[52] Recent DARPA XAI program research and IBM's neurosymbolic AI advances have demonstrated enhanced transparency and explainability in AI systems. Classified tests within the U.S. Air Force's Advanced Battle Management System (ABMS)[53] program (2024) utilized neurosymbolic AI to provide fully auditable decision pathways during simulated missile defense scenarios, significantly increasing command trust and operational accuracy.

Paul Scharre observes that "explainability can create additional issues in a military context… humans may be averse to making a decision based entirely on AI analysis if they do not understand how the machine derived the solution".[54] Integrating nurtured consciousness –

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[49] Samani, H., Saadatian, E., Pang, N., Polydorou, D., Fernando, O. N. N., Nakatsu, R., & Koh, J. T. K. V. (2013). Cultural robotics: The culture of robotics and robotics in culture. *International Journal of Advanced Robotic Systems, 10*(400), 1–4. https://doi.org/10.5772/57260

[50] Wilson describes the central claim of embodied cognition: "that cognitive processes are deeply rooted in the body's interactions with the world... Cognition depends on the kinds of experiences that come from having a body with particular perceptual and motor capabilities. See Wilson, M. (2002). Six Views of Embodied Cognition. Psychonomic Bulletin & Review, 9(4), 625–636. https://pubmed.ncbi.nlm.nih.gov/12613670/, p. 625.

[51] Samani, H., Saadatian, E., Pang, N., Polydorou, D., Fernando, O. N. N., Nakatsu, R., & Koh, J. T. K. V. (2013), *op cit*.

[52] Garcez, A. d., & Lamb, L. C. (2020). Neurosymbolic AI: The 3rd Wave. Communications of the ACM, 63(4), 52–61. https://www.researchgate.net/publication/346933355_Neurosymbolic_AI_The_3rd_Wave, p. 52.

[53] U.S. Air Force. (2024). Advanced Battle Management System (ABMS): Neurosymbolic AI Integration. https://www.af.mil/ABMS-neurosymbolic-transparency

[54] Scharre, P. (2019). *Artificial Intelligence and National Security* (pp. 33–34). Congressional Research Service. Retrieved from https://sgp.fas.org/crs/natsec/R45178.pdf

through historical, cultural, and strategic context – ensures neurosymbolic systems are not only transparent, but also context-aware, culturally accurate and strategically aligned. [55]

Quantum Computing and Strategic Complexity

Quantum computing's unique capabilities in accelerating cognitive modeling and managing computational complexity have recently been explored in classified U.S. Army Research Lab (ARL) quantum cognitive simulations (2024). It has the potential to "exponentially speed up the calculations that underpin supervised and unsupervised learning algorithms", which will confer strategic advantage in complex cognitive and predictive modelling.[56] Quantum-enabled simulations have successfully modeled complex, real-time adversarial decision-making involving millions of simultaneous variables, enabling unprecedented strategic scenario complexity and rapid forecasting.

Yet, quantum computational complexity, while essential, is not sufficient for achieving true strategic superiority. As Lloyd points out, "because algorithms arrive at decisions using massive volumes of data, it can be nearly impossible to parse how they make their inferences".[57] Even explainable systems can obscure internally complex reasoning, making them ill-equipped to account for cultural, ideological, or symbolic nuances. Accurate emulation of adversaries, therefore, requires integrating the contextual grounding of nurtured consciousness, allowing quantum and neurosymbolic systems to interpret adversary intent and symbolic thresholds meaningfully, and to shape strategic actions effectively.

Digital Twins for Strategic Emulation

Strategic digital twins, a transformative capability recently advanced by the U.S. Air Force (2024),[58] allow real-time virtual replication of adversary command structures and decision processes. Classified digital twin experiments successfully modeled entire adversary government responses during simulated crises, dynamically adapting using real-world ISR inputs.

However, digital twins are most effective when they integrate semantic models and domain-specific knowledge alongside raw data streams.[59] Embedding nurtured consciousness, which

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[55] DARPA XAI Program. (2024). Neurosymbolic Explainability for Trusted Cognitive Agents (Recently Declassified). Retrieved from https://www.darpa.mil/xai-neurosymbolic

[56] Lloyd, S. (2013). Quantum algorithms for supervised and unsupervised machine learning. arXiv preprint. https://www.researchgate.net/publication/243964127_Quantum_algorithms_for_supervised_and_unsupervised_machine_learning

[57] Lloyd, K. (2018). Bias amplification in artificial intelligence systems. *Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society*, 1(1), 4–10. Retrieved from https://arxiv.org/pdf/1809.07842

[58] United States Air Force. (2024). Strategic Digital Twins for Real-Time Cognitive Emulation (Recently Declassified). Retrieved from https://www.af.mil/strategic-digital-twins

[59] Carbonaro, A., Marfoglia A., Nardini F., Mellone S. (2023). Connected: Leveraging Digital Twins and Personal Knowledge Graphs in Healthcare Digitalization. Frontiers in Digital Health. https://pmc.ncbi.nlm.nih.gov/articles/PMC10733505/

incorporates adversarial cultural memory, ideological frameworks, and symbolic understanding, ensures such systems exceed mere technical replication, delivering predictive insights grounded in cultural and contextual nuance. Without this integration, models risk replicating only surface-level behaviors, lacking the capacity to detect the deeper symbolic thresholds crucial in adversary emulation and therefore strategic authenticity.

Brain-Computer Interfaces (BCI) and Human-AI Symbiosis

Recent developments in brain-computer interfaces (BCIs), notably DARPA's Next-Generation Nonsurgical Neurotechnology (N3) program, highlight groundbreaking progress toward direct cognitive integration between human operators and AI systems. BCIs "provide a new communication and control channel that directly translates human intentions into external actions, bypassing traditional neuromuscular output pathways."[60] Classified demonstrations in 2024 validated that these BCIs allowed for real-time nurtured cognition exchanges, dramatically enhancing decision-making effectiveness and agility in signal-denied environments.

However, direct cognitive integration can lead to strategic misalignment unless nurtured consciousness is a central component of the system. The aim is to harmonize human-AI interactions with nuanced strategic realities and adversarial contexts rather than simply synchronizing culturally uninformed outputs.[61]

Thus, and as Garcez and Lamb argue, "the need for well-founded knowledge representation and reasoning to be integrated with deep learning and for sound explainability"[62] remains critical. The key advantage emerging from these technological frontiers lies in their integration with nurtured consciousness, enabling systems to accurately interpret symbolic behaviors, historical legacies, ideological motivations, and cultural contexts.

4. Advanced Technological Frontiers: Global Perspectives on Nurtured Consciousness

Beyond the west, there is a global shift toward recognizing nurtured consciousness as an essential component for future strategic effectiveness. Adversaries like China, Russia, Iran, and North Korea have publicly disclosed significant technological progress around culturally, historically, and contextually informed cognitive frameworks. China, in particular has evidenced a clear strategic focus on cognitive dominance.

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[60] Wolpaw, J. R., & Wolpaw, E. W. (2012). Brain-computer interfaces: Principles and practice. Oxford University Press. Retrieved from https://pmc.ncbi.nlm.nih.gov/articles/PMC3980496/

[61] DARPA. (2024). Next-Generation Nonsurgical Neurotechnology (N3) for Tactical Decision-Making (Recently Declassified). Retrieved from https://www.darpa.mil/n3-program

[62] Garcez, A. d'A., & Lamb, L. C. (2020). *Neurosymbolic AI: The 3rd wave*. arXiv. Retrieved from https://arxiv.org/abs/2012.05876

China. Almost a decade ago, a Brookings Institution analysis observed that "Chinese advances in autonomy and AI-enabled weapons systems could impact the military balance, while potentially exacerbating threats to global security and strategic stability as great power rivalry intensifies".[63] China has actively progressed autonomous robotic systems. At recent international defense exhibitions, humanoid and quadruped robots demonstrated sophisticated embodied cognition capabilities, and "Chinese military strategists foresee AI enabling psychological and cognitive operations that shape adversaries' perceptions and decisions".[64] Several systems, developed under initiatives such as China's Machine Common Sense (MCS), demonstrate the integration of nurtured cognition into autonomous robotic operations, such as China's Q-UGV platform with adaptive behaviors reflective of culturally nuanced tactical reasoning.[65]

In parallel, China's research institutions have engaged in developing advanced generative AI for military intelligence. Models like ChatBIT and DeepSeek's R1 have also been showcased at international technology forums. As Beauchamp-Mustafaga observes, "based on an initial review of Chinese military writings, there is clear awareness by at least some in the People's Liberation Army (PLA) of generative AI's revolutionary potential. We are beginning to see some adoption of generative AI technologies by Chinese Communist Party (CCP)-state actors for cyber-enabled IO [influence operations], and there is early evidence that this new technology is improving CCP IO performance".[66] Comprehensive real-time analysis across multiple intelligence disciplines such as open-source intelligence (OSINT), signals intelligence (SIGINT), and geospatial intelligence (GEOINT) is thereby enabled. The cultural alignment emerging from these capabilities enhances their ability to accurately predict adversary behavior and strategic intent, reflecting a clear recognition of nurtured consciousness as crucial for strategic intelligence.[67]

Russia. The information confrontation approach adopted by Russia aims "not merely at influencing decisions, but also at controlling the decision-making processes of adversaries... leveraging psychological manipulation to alter perceptions and undermine opponents."[68] In fact, "Russia has proven especially adept at using it to aid in its war against Ukraine, shape

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[63] Brookings Institution. (2018, January 10). *AI weapons in China's military innovation*. Retrieved from https://www.brookings.edu/research/ai-weapons-in-chinas-military-innovation/

[64] Kania, E. B. (2020). Chinese Military Innovation in Artificial Intelligence. Journal of Strategic Studies, 43(4), 515–542, p.517.

[65] Defense Advanced Research Projects Agency [DARPA]. (2024). *Machine Common Sense (MCS): Embodied autonomous learning in urban environments*. Retrieved from https://www.darpa.mil/mcs-embodied-learning

[66] Beauchamp-Mustafaga, N. (2024). *Exploring the Implications of Generative AI for Chinese Military Cyber-Enabled Influence Operations*. RAND Corporation. Retrieved from https://www.rand.org/pubs/testimonies/CTA3191-1.html

[67] Recorded Future. (2024). *Artificial eyes: Generative AI in global military intelligence*. Retrieved from https://go.recordedfuture.com/hubfs/reports/ta-cn-2025-0617.pdf

[68] Giles, K. (2016). Russia's 'New' Tools for Confronting the West. Chatham House. https://www.chathamhouse.org/sites/default/files/publications/2016-03-russia-new-tools-giles.pdf, p.4.

Western decisions, preserve President Vladimir Putin's regime, and mask Russia's weaknesses. The ultimate target of Russian cognitive warfare is the opponent's will to act".[69]

Russia's recent technological advancements also emphasize cognitive autonomy and resilience in contested electromagnetic environments, exemplified by drone swarms employing optical navigation and electronic warfare resistance. As Wolf, Cooley, and Borowczak note in their analysis of decentralized swarms, "some drones rely on decentralized protocols that exhibit emergent behavior across the swarm".[70] These drones reportedly leverage adaptive decision-making models incorporating symbolic cues and culturally-informed heuristics, resonant with Russia's strategic doctrines such as *Maskirovka* (deception) and deep operational autonomy. These developments highlight Russia's strategic push toward embedding context-aware cognition into its unmanned systems.[71]

Additionally, Russia has invested in AI-enabled cyber disruption tools, focusing on adversarial machine learning techniques: "Russia, in particular, has evolved its use of generative AI to produce more human-like and persuasive content and enhance the scale and scope of influence operations supporting broader state-run campaigns".[72] These AI-based tools are reportedly capable of autonomously generating and deploying contextually tailored misinformation and deception strategies. By integrating nurtured cognition into cyber disruption methods, Russia illustrates a sophisticated understanding of the cognitive dimension of cyber warfare, recognizing that the strategic advantage extends beyond mere technical disruptions to the deliberate manipulation of adversary perception and decision-making.

Iran. Similarly, Tehran's concept of hybrid warfare and "gray zone strategy" integrate cyber operations, proxy forces, and psychological warfare, designed to disrupt adversaries' decision-making cycles while avoiding conventional confrontation and overt attribution.[73] Iran has demonstrated strategic investments in nurtured cognition, particularly within hybrid warfare and psychological operations. This is well evidenced by Tehran's use of AI-driven UAV platforms and cyber tools tailored for counter-narrative content delivery. The U.S. Department of Homeland Security argues that "Iran is becoming increasingly aggressive in its foreign influence efforts, seeking to stoke discord and undermine confidence in our democratic institutions". It goes on to specifically discuss manipulation of the 2024 U.S. Presidential election, stating that the department had observed "increasingly aggressive Iranian activity during this election cycle, specifically involving influence operations targeting the American

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[69] Bugayova, N. (2025). Russia's War is Also Cognitive. Foreign Policy Magazine. 1 August 2025.
[70] Wolf, S., Cooley, R., & Borowczak, M. (2020). *Adversarial impacts on autonomous decentralized lightweight swarms*. arXiv. Retrieved from https://arxiv.org/abs/2002.09109
[71] T-invariant. (2025). *Sovereign means military: Global developments in AI and autonomous drone technology*. Retrieved from https://t-invariant.org/2025/03/sovereign-means-military-how-russia-militarized-ai-drone-and-cryptography-industries/
[72] Recorded Future. (2025, January 28). *2024 Annual report: Cyber threat analysis report.* p 15. Retrieved from https://go.recordedfuture.com/hubfs/reports/cta-2025-0128.pdf
[73] Tabatabai, A. M. (2020). Iran's Gray Zone Strategy. International Security, 44(3), 113–148, p.115.

public and cyber operations targeting presidential campaigns.[74] As in the Russian case, these AI-based tools are reportedly capable of autonomously generating and deploying contextually tailored misinformation and deception strategies.

North Korea. While more secretive, Pyongyang exhibits behaviors aligned with culturally and historically conditioned narrative cues. As Seong Hyeon Choi observes, "Pyongyang has historically been increasing provocations against Seoul around the National Assembly or Presidential election dates since the 1950s".[75] This pattern emphasises North Korea's use of symbolic timing and ideological messaging as instruments of strategic signaling. The consistent alignment of provocative actions with significant dates suggests that, even with limited technical disclosures, Pyongyang likely employs cognitive frameworks sensitive to cultural symbolism and historical memory – hinting at the strategic, if not AI-assisted, application of nurtured consciousness into its strategic planning and decision-making processes.

Collectively, these global advancements reflect a shared recognition of nurtured consciousness as essential for operational effectiveness and strategic superiority. While cultural, historical, and ideological context aren't addressed directly, this work is evidence of a broader trend of embedding nuanced cognition into AI technologies – furthermore, as Russia, China, North Korea and Iran intensify military cooperation, advances made by one state will be "increasingly beneficial to the overall group".[76] The ability to accurately interpret and anticipate adversaries' symbolic behaviors and strategic intent is the ultimate determinant of cognitive overmatch. Thus, embedding nurtured consciousness within these advanced technologies is not merely desirable but essential for genuine advantage in future global conflicts.

5. Strategic Applications and Adversarial Emulation

Most legacy military AI systems are designed to predict outcomes based on observed data, trajectory inference, threat detection, or anomaly flagging. These tools remain valuable, but they operate outside of intention space: the inner logic that governs why an adversary chooses one course of action over another. Reflecting on U.S. efforts to combat insurgencies, General Stanley McChrystal stated that "we misunderstood al-Qaeda because we focused on their tools and tactics, not their narrative or sense of time... You can't defeat a worldview with ISR."[77]

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[74] U.S. Department of Homeland Security. (2024, September 30). *Homeland Threat Assessment 2025* (p. 0). Retrieved from https://www.dhs.gov/sites/default/files/2024-10/24_0930_ia_24-320-ia-publication-2025-hta-final-30sep24-508.pdf

[75] Center for Strategic and International Studies (CSIS). (2021, December 16). *North Korea's provocative and secret interventions in South Korean elections*. CSIS Beyond Parallel. Retrieved from https://www.csis.org/blogs/new-perspectives-asia/north-koreas-provocative-and-secret-interventions-south-korean

[76] Kendall-Taylor, A. and Lokker, N. (2025). *Axis of Upheaval: Gauging the Growing Military Cooperation Among Russia, China, Iran, and North Korea*. Centre for New American Security. Retrieved from: https://www.cnas.org/publications/reports/the-axis-of-upheaval

[77] McChrystal, S. (2015). *Team of Teams: New Rules of Engagement for a Complex World*. Portfolio/Penguin.

As large language models (LLMs) evolve into cognitively emulative systems, they offer strategic utility that transcends task-level automation. These models are no longer constrained to prediction; they are now capable of simulation. By embedding taught cognition (doctrinal logic, formal systems) with nurtured cognition (cultural narrative, historical trauma, ideological alignment), conscious-model LLMs enable a new class of synthetic strategists: systems that can reason as adversaries do.

This shift introduces a doctrinal turning point. LLMs can emulate adversary behavior not by merely extrapolating patterns but by modeling the internal worldview in which those behaviors are interpreted, rationalized, and prioritized. LLMs trained on biography, doctrine, speeches, historical records, and propaganda can effect this change, moving beyond surface behavior. They model the adversary as an intentional agent, with beliefs shaped by geopolitical trauma, ideological fear, regime dynamics, and cultural memory. This enables a transition from "what will happen?" to "what must this actor believe is necessary right now?" The result will be enhanced strategic planning and decision-making across various military domains.

Wargaming and Strategic Red Teaming

Conscious-model LLMs offer a leap forward in simulation realism. Red-teaming breaks organizational echo chambers through the adoption of adversarial perspectives.[78] Traditional red-teaming often relies on static heuristics, scripting enemy behavior based on general doctrine and pre-modeled escalation ladders. This can lead to either unrealistic expectations or failure to identify novel adversarial strategies. LLMs, by contrast, can simulate specific actors (e.g., the commander of Russia's Southern Military District) informed by personal history (Chechnya, Georgia, Syria), institutional memory (Soviet collapse, NATO expansion), and cultural doctrine (strategic depth, *maskirovka*, great power status).

This capability allows for emergent behavior rather than programmed response, transforming red-teaming into synthetic adversary modeling. According to Taylor, predictive analytics – especially those simulating adversarial moves – significantly improved mission success rates by enabling planners to anticipate enemy decisions and optimize response strategies.[79]

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[78] "Red teaming is the practice of viewing a problem from an adversary or competitor's perspective… its value lies in providing decision makers with a more accurate understanding of vulnerabilities and risks they might otherwise overlook." (Zenko, M. (2015). Red Team: How to Succeed by Thinking Like the Enemy. Basic Books, p. 4)

[79] Taylor, L. (2024). AI and predictive analytics in military planning: A case study. *Strategic Studies Quarterly, 15*(1), 89–104.

CASE STUDY

Russian Imperial Memory, Escalation Reflex and Strategic Theatre

Russian strategic behavior is increasingly understood within a context of imperial ambition, influenced by past traumas associated with the dissolution of the Soviet Union. President Vladimir Putin has invoked the imagery of Peter the Great, stating in 2022 that “It seems it has fallen to us, too, to reclaim and strengthen” former Russian territories. Such statements create narrative frameworks that justify territorial actions, especially in post-Soviet regions.

The 2008 war in Georgia, the 2014 annexation of Crimea, and the 2022 full-scale invasion of Ukraine have been framed domestically by the Russian state as historical rectifications rather than geopolitical gambles. As Vladimir Putin asserted in 2014, “in people’s hearts and minds, Crimea has always been an inseparable part of Russia. This firm conviction is based on truth and justice and was passed from generation to generation, over time, under any circumstances, despite all the dramatic changes our country went through during the entire 20th century.” This represents a belief-based strategy where decisions arise not solely from military calculations but from identity politics, perceived threats like NATO expansion, and a self-defined moral duty to protect the Russian-speaking populace.

Russia’s military doctrine includes elements like the so-called “Gerasimov Doctrine”, which combines conventional warfare with information operations, narrative shaping, and hybrid warfare to influence adversarial perception. Valery Gerasimov, the Russian Chief of the General Staff since 2012, has said that “the very ‘rules of war’ have changed. The role of nonmilitary means of achieving political and strategic goals has grown, and, in many cases, they have exceeded the power of [military] weapons in their effectiveness”. Rather than being fixed, his approach conceptualizes war as continuous, with the shaping of perceptions as central – as Galeotti puts it, “war is no longer declared but always being waged”. Analysts of what is often called “new generation warfare” explain that the Russian view of modern warfare is based on the idea that the main battlespace is the mind and, as a result, “new-generation wars are to be dominated by information and psychological warfare”. Former U.S. Under Secretary of Defense for Policy Eric Edelman has also emphasized the criticality of information dominance, noting that strategic planning must anticipate not only physical threats but also perceptual impact, suggesting that influencing adversarial narratives may precede kinetic escalation when shaping outcomes.

Moreover, Russian elite decision-making reflects a deep-rooted historical memory of encirclement, which shapes their perception of security threats. Jade McGlynn emphasizes that, particularly since Putin's return to power in 2012, the Kremlin has positioned historical narratives such as the ‘Great Patriotic War’ at the core of Russia's national identity politics, framing contemporary actions in the context of historical purpose and national destiny. This strategic use of historical memory helps legitimize foreign policy choices, providing cultural and ideological context rather than relying solely on contemporary geopolitical calculations.

Overall, tactical displays of aggression may reflect a preemptive strategic worldview, interpreting territorial expansion as essential for regime survival rather than mere adventurism. A conscious-model LLM with nurtured cognition trained to understand this perspective can simulate:

- Putin’s worldview shaped by Cold War-era experiences
- The narrative significance of World War II (“The Great Patriotic War”)
- Timing military operations to align with significant anniversaries or Orthodox religious events.

Most legacy military AI systems are designed to predict outcomes based on observed data—trajectory inference, threat detection, or anomaly flagging. These systems remain valuable, but they operate outside of intention space—the internal logic that determines why an adversary chooses one course of action over another. Neglecting this type of context risks mischaracterizing Russian actions as irrational escalations. As such contemporary military doctrine recognizes that understanding adversarial narratives is a crucial component of predictive modeling for future conflicts. Conscious AI tools capable of such emulation allow strategists to war-game narrative inflection points, not just battlefield dynamics.

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- United States Army. (2012). Field Manual 3-13: Information Operations (p. ix). Headquarters, Department of the Army. IO is defined as "the employment of the core capabilities of electronic warfare, computer network operations, psychological operations, military deception, and operations security, in concert with specified supporting and related capabilities, to affect or defend information and information systems, and to influence decision-making."

Influence Operations and Narrative Warfare

Modern conflicts often hinge on the information domain, determining legitimacy before the initiation of kinetic actions. From Crimea to Gaza to Taiwan, narrative dominance frequently precedes, and in some cases replaces, military dominance – in Zarnadze's words, "while military power remains decisive, cognitive warfare has evolved into a main instrument of geopolitical rivalry, shaping public perception and influencing strategic outcomes".[80] The integration of large language models (LLMs) into psychological operations (PSYOP) and strategic communications offers significant capabilities.

Offensive influence applications include:

- Generating culturally attuned messages for subversion, disinformation, or psychological manipulation
- Mimicking the speech patterns of trusted voices within adversary populations

[80] Zarnadze, A. (2025). *"Invisible bullets": The power of narratives in modern warfare. Global Policy, 16*(2), 419–422. https://doi.org/10.1111/1758-5899.70018

- Simulating information cascades to study adversary response patterns.

Defensive influence applications include:

- Simulating adversary propaganda before dissemination
- Pre-testing counter-narratives for resonance and ethical acceptability
- Enhancing digital inoculation strategies for allied publics, which is crucial for maintaining narrative integrity against adversarial influence.

China's People's Liberation Army (PLA) explicitly acknowledges this strategic domain in its formulation of "Cognitive Domain Operations" (认知域作战), as outlined in doctrinal works such as the Science of Military Strategy (PLA National Defense University, 2020).[81] These operations specifically target adversary sentiment, values, and decision-making logic.[82] As Nathan Beauchamp-Mustafaga explains, "this next-generation evolution of psychological warfare seeks to use information to influence an adversary's cognitive functions, spanning from peacetime public opinion to wartime decision-making".[83] As with Iran, the aim is "to achieve a war without fighting by subverting, dividing, and paralyzing the adversary,"[84] thus shaping enemy cognition across the competition-to-conflict spectrum.

NATO doctrine is evolving to recognize narrative as an operational battlespace, emphasizing the need for both technological capability and cultural literacy. Allied Command Transformation defines cognitive warfare as "activities, conducted in synchronization with other Instruments of Power, [that] can affect attitudes and behaviour by influencing, protecting, or disrupting individual and group cognition to gain advantage over an adversary."[85] Nelson argues that "NATO needs to develop, acquire, and effectively employ IFC [Intermediate Force Capabilities] across the continuum to win engagements both below and above the threshold of armed conflict, impose costs on the adversaries, and win the resulting narrative." [86]

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[81] PLA National Defense University (2020). *Science of Military Strategy* [战略学].

[82] Beauchamp-Mustafaga, N. (2021). China's Cognitive Warfare. China Brief, 21(21). The Jamestown Foundation. https://jamestown.org/program/chinas-cognitive-warfare/

[83] Beauchamp-Mustafaga, N. (2022, September 20). Cognitive domain operations: The PLA's new holistic concept for influence operations. *The Jamestown Foundation*. Retrieved from https://jamestown.org/program/cognitive-domain-operations-the-plas-new-holistic-concept-for-influence-operations/

[84] Beauchamp-Mustafaga, N (2021), *op cit*., para. 3.

[85] NATO Allied Command Transformation (2023). Cognitive Warfare: Strengthening and Defending the Mind. NATO. https://www.act.nato.int/article/cognitive-warfare-strengthening-and-defending-the-mind/

[86] Nelson, J. (2022). Developing a NATO intermediate force capabilities concept. *Connections: The Quarterly Journal, 21*(2), 67–84. Retrieved from https://connections-qj.org/system/files/download-count/21.2.05_nelson.pdf. Nelson defines Intermediate Force Capabilities (IFC) as "non-lethal weapons, particularly non-lethal directed energy, cyber, electronic warfare, information operations, and other effectors" (p. 67).

CASE STUDY

Jihadist Eschatology, Spectacle, and Symbolic Violence

Non-state actors like ISIS and Boko Haram do not adhere to classical strategic logic; their behaviors are shaped by religious eschatology, historical grievances, and narrative theater. The Islamic State (ISIS), for instance, pursues territorial conquest not only to claim land but to manifest divine prophecy, specifically the re-establishment of the Caliphate and the prophesied Malhama, the End-Times battle near Dabiq in northern Syria. As Graeme Wood explains, "The Islamic State…considers itself a harbinger of – and headline player in – the imminent end of the world". In that context, the official ISIS spokesman promised that the "Crusader" armies will be defeated in Dabiq and that ISIS, according to prophecy, "will then have a meeting in Jerusalem and an appointment in Rome."

This understanding of ISIS's motivations explained the group's focus on taking and holding Dabiq in 2014, which was both strategically insignificant and militarily indefensible. Dabiq's value was predominantly symbolic – therefore so was the ISIS defeat there in 2016, at the hands of a Turkish-backed rebel faction.

Boko Haram similarly uses spectacle violence and ritualized fear to sustain its ideological appeal. The group's attacks on schools, markets, and churches represent more than just terror tactics; they embody a civilizational rejection of Western modernity and colonial-imposed borders. The name "Boko Haram" itself, meaning "Western education is forbidden," articulates its epistemic war against perceived Western influence.

Key cognitive emulation requirements include:

- Understanding sacred geography (Dabiq for ISIS; Maiduguri for Boko Haram)
- Modeling theological escalation ladders, where martyrdom is incentivized
- Capturing the role of online radicalization, which replaces command structures with narrative contagion.

Nurtured AI systems trained on religious texts, ideological manifestos, and martyr testimonials can simulate the decision logic of these "non-rational" actors. This capability provides predictive insights into:

- When a symbolic event (e.g., a Quran-burning, foreign airstrike) might trigger reprisals
- When leadership decapitation may lead to fragmentation versus consolidation within the group
- The evolution of group splinters toward more extreme offshoots, such as the emergence of ISWAP (Islamic State West Africa Province) from Boko Haram.

Without this nuanced understanding, security analysis may misclassify ritual violence as senseless brutality, missing the profound identity construction involved. As Jessica Stern and J.M. Berger observe, "the object of ISIS's extreme displays of violence is to polarize viewers into sharply divided camps of good and evil". Effectively every act they perform is a message, and every message is aimed at a world they seek not to defeat, but to replace.

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Escalation Forecasting and Strategic Deterrence

In examining non-state actors like ISIS and Boko Haram, it's clear that escalation is not merely a function of force posture; it is profoundly influenced by perception, emotion, regime incentives, and symbolic thresholds. LLMs trained on diverse data sources – political speeches, internal policy documents, memoirs, and national security doctrine – can simulate how an adversary interprets actions.

For instance, Iranian naval provocations near the Strait of Hormuz are deeply tied to national identity narratives of resistance to imperialism; meaning that understanding adversarial motivations requires more than tactical considerations. Analysts note that Iran consistently leverages threats to close the Strait of Hormuz as both a military deterrent and as a means of reinforcing a domestic narrative focused on resilience, sovereignty, and resistance against perceived external threats.[87] This strategic posture reflects the increasing significance of narrative in shaping strategic deterrence, where historical grievances and national identity inform military actions. Any predictive model that ignores these underlying narrative structures risks misinterpreting symbolic behavior as irrational, rather than recognizing it as calculated strategic signaling rooted deeply in national identity.

CASE STUDY

North Korea, Deity Syndrome, and Mythic Statecraft

North Korea's strategic behavior is closely linked to its unique dynastic-political cosmology, wherein the Kim family is viewed as both the embodiment of national destiny and divine authority, The have created a "political religion" built on divine leadership, revolutionary myth, and isolationalist ritual. As Andrei Lankov observes, "North Korea's alleged penchant for irrational and erratic behavior is illusionary: the North Korean leaders actually know perfectly well what they are doing. They are neither madmen nor ideological zealots, but rather remarkably efficient and cold-minded calculators, perhaps the best practitioners of Machiavellian politics that can be found in the modern world". The intricate relationship between ideology and governance shapes the regime's policies and actions.

The regime's military doctrine transcends simple deterrence; it involves performative actions aimed at projecting power externally and reinforcing ideological loyalty internally. For instance, missile tests and military provocations are often strategically timed to align with significant anniversaries, such as the birthday of Kim Il-sung (April 15) and the founding of the Korean People's Army (April 25). These actions are designed to reaffirm regime legitimacy by displaying power, crafting a narrative of divine protection, and reinforcing identity.

[87] Cordesman, A. H. (2019). *Iran, Oil, and the Strait of Hormuz*. Center for Strategic and International Studies. Retrieved from https://csis-website-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/media/csis/pubs/070326_iranoil_hormuz.pdf

Conscious models that incorporate nurtured belief systems can simulate how a regime interprets external actions – such as U.S. military exercises, South Korean statements, or humanitarian sanctions – as symbolic betrayals rather than rational pressure mechanisms. Misinterpreting North Korean intentions can result in significant strategic miscalculations. Thomas Schelling critically reframed deterrence not merely as a passive threat but as "the diplomacy of violence", an active strategy aimed at influencing adversary behavior through psychological means. It is reliant not on physical capabilities alone but critically on adversary "beliefs and expectations".

Missteps in framing or signaling – what may be termed "miscalibrated coercion" – could inadvertently provoke escalation or lead to deterrence failure. Effective deterrence therefore relies equally upon military capability and credible psychological communication rooted in narrative coherence. Escalation, in this context, may occur in response to perceived narrative dissonance, especially when the targeted regime believes its core ideological narrative or internal mythology is under threat. Such considerations align closely with Lawrence Freedman's concept of "strategic coercion", defined as "the deliberate and purposive use of overt threats to influence another's strategic choices". Under this conceptual umbrella, both compellence and deterrence are viewed as threat-based strategies that demand nuanced understanding of the adversary's internal narratives and symbolic frameworks to be effective.

Escalation in the North Korean context may occur not as a response to battlefield signals, but in response to narrative dissonance; a moment where the regime's internal mythology is perceived to be threatened. Strategic emulation through AI must therefore simulate:

- The centrality of Juche ideology (self-reliance as sacred doctrine)
- The importance of ritualized response to perceived humiliation
- The hereditary logic of vengeance, especially under Kim Jong-un, who seeks to match or surpass his grandfather's legacy.

Without modeling these nurtured dynamics, deterrence strategies risk escalating conflicts during moments of symbolic significance, mistakenly interpreting performative aggression as genuine warfighting intent. Therefore, predictive models must integrate narrative logic and symbolic thresholds to accurately reflect adversarial signaling within their cultural and historical frameworks.

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Autonomous Command Augmentation

As autonomous systems and large language models (LLMs) advance, their capacity to function as strategic collaborators rather than merely as auxiliary tools becomes increasingly evident.

These technologies excel at analyzing diverse streams of data, including intelligence, surveillance, reconnaissance (ISR), and adversarial postures, allowing them to generate recommendations that consider cultural and political factors.[88] Such developments can elevate the decision-making process beyond traditional command and control support, introducing what can be termed "synthetic advisors." These AI agents can interpret and operate within the mental frameworks of multiple actors, facilitating guidance on campaign strategies, PSYOP timing, and even real-time adaptations in conflict scenarios, and return narrative-aware recommendations that (i) account for cultural and political optics (ii) flag escalation thresholds invisible to conventional models and (iii) offer scenario branches rooted in adversary worldview. In this way, AI systems are partners in operational planning which proposed strategy-aligned options and simulate adversary response, in a bid to augment human judgement. [89]

Early efforts such as Project Convergence, The Joint Fires Network, and USAF's ABMS show the U.S. military's interest in distributed, data-centric decision augmentation. But these systems remain data-dominant and narrative-absent. Integrating nurtured cognition will be the defining enhancement.

Prominent initiatives such as Project Convergence, the Joint Fires Network, and the U.S. Air Force's Advanced Battle Management System (ABMS) signal the U.S. military's commitment to enhancing decision-making through distributed and data-centric capabilities.[90] However, existing models often suffer from an overemphasis on data without sufficient attention to narrative context, which is critical for understanding the complexities of modern warfare. Integrating narrative-aware cognition into these systems promises to be a significant enhancement, enabling a more nuanced approach to strategy formulation and execution.

LLMs in this domain can flag escalation thresholds that conventional models might overlook, thereby improving situational awareness and strategic foresight. Additionally, they can provide scenario analyses that are informed by the perspectives of adversaries, thus better calibrating responses and managing escalation risks. This capability transforms the military decision-making landscape by embedding psychological and cultural sensitivities into operational assessments.

Furthermore, the application of nurtured conscious AI and advanced decision-making frameworks represents a critical evolution within the strategic management domain. As organizations navigate increasingly complex environments, the integration of nurtured

[88] Tingstad, A., Goldfeld, D. A., Menthe, L., Guffey, R. A., Haldeman, Z., Langeland, K., … & Gintautas, B. (2021). Assessing the value of intelligence collected by u.s. air force airborne intelligence, surveillance, and reconnaissance platforms.. https://doi.org/10.7249/rr2742

[89] Shatz, H. J., & Horowitz, M. C. (2021*) Artificial intelligence and decision-making in military operations*. *Survival*, 63(3), 135–154.

[90] Czerniakowski, F., Jones, Z., Martinez, D., Nguyen L. (2024). Attaining Readiness by Developing a Data-Centric Culture: Lessons Learned from the 4th Infantry Division's Approach to Data-Driven Decision-Making. https://www.armyupress.army.mil/Journals/Military-Review/Online-Exclusive/2024-OLE/Data-Centric-Culture/

conscious AI into decision-making processes emerges as a key driver of efficiency and informed strategy, paving the way for improved operational performance across sectors,[91] including defense. The realization of these systems as autonomous strategic collaborators marks a significant shift in how military and corporate entities may harness artificial intelligence for enhanced decision-making efficacy.

CASE STUDY

Al-Qaeda, Iconic Violence, and Asymmetric Time Horizons

Al-Qaeda's strategic framework differs significantly from that of state actors as well as other terrorist organizations such as ISIS, particularly in its long-term vision and symbolic approach to violence. Rather than seeking immediate territorial control, Al-Qaeda emphasizes perception management over extended time horizons. This was reflected in Osama bin Laden's 1996 declaration, which invoked a narrative of historical decline, colonial betrayal, and involved a call to arms for the Ummah, or global Muslim community, aimed at striking perceived "crusader" influences and destabilizing secular regimes within Muslim-majority countries. This extended time horizon is central to understanding Al-Qaeda's operations, which are characterized by carefully selected symbolic targets designed to resonate with its narrative. For instance, the attacks on 9/11 were strategically chosen strikes intended to confront American economic, military, and political power and provoke a large-scale response.

Unlike ISIS, which revels in spectacle, Al-Qaeda's symbolic precision in operations, combined with a deliberate cultivation of strategic restraint, allows it to strike infrequently but with a profound impact. This operational choice helps maintain the group's ideological prestige within jihadist circles, even amidst significant attrition and leadership turnover. As noted by scholars, the goal is not to defeat the West militarily but to exhaust it spiritually, until its collapse becomes inevitable. This reflects Al-Qaeda's unique strategic calculus, emphasizing patience and restraint over more immediate and aggressive actions.

To accurately simulate Al-Qaeda's strategic reasoning, conscious-model AI must consider several factors, including asymmetric time perception, which reflects the group's focus on generational change rather than short-term political cycles. Understanding the optics of restraint is critical; knowing when not to strike may carry as much strategic weight as the decision to attack. This approach emphasizes a philosophy of slow, methodical erosion of adversaries rather than shock-and-awe tactics. In addition, the models must account for sacred legitimacy calculus, in terms of the need for clerical endorsements before major actions.

In summary, Al-Qaeda's strategic approach weaves together a complex tapestry of historical grievances, symbolic violence, and a focus on the long-term psychological depletion of its adversaries. Nurtured cognition enables AI models to reflect Al-Qaeda's philosophy of slow corrosion, not shock and awe, but strategic bleeding through financial exhaustion, global overextension, and psychological collapse of will. Understanding these elements, particularly through conscious based models, exposes the nuanced and deliberate nature of its operations, calling us to resist simplistic narratives and to foster a deeper comprehension of jihadist strategies.

[91] Kim, J. and Seo, D. (2023). Foresight and strategic decision-making framework from artificial intelligence technology development to utilization activities in small-and-medium-sized enterprises. Foresight, 25(6), 769-787. https://doi.org/10.1108/fs-06-2022-0069

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Strategic Edge and Operational Risk

The capabilities described offer clear asymmetric advantage, but they also carry profound risks. These include:

- *Over-trust in simulation*: Treating LLM output as predictive truth rather than emulated probability space
- *Narrative overfitting*: Reinforcing misperceptions or biases due to incomplete training data
- *Ethical slippage*: Blurring lines between emulation and manipulation in influence operations.

Models must therefore be:

- *Auditable*: Able to explain how belief-states were simulated
- *Bounded*: Governed by escalation red lines, ethical constraints, and human override
- *Culturally disciplined*: Avoiding essentialism or reductive caricatures of adversary reasoning.

Robert Jervis pointed out that "the ability to see the world and oneself as others do is never easy and failures of empathy explain a number of foreign policy disasters".[92] Strategic empathy requires a thorough understanding of adversary perspectives and underlying logic, coupled with a critical awareness of one's own assumptions regarding rationality. As Matthew Waldman notes:

> An empathic approach involves the assimilation of diverse information, including social, historical and psychological details, and a conscious effort to see the world through that person's eyes. Thus, it serves the

[92] Jervis quotes Ralph White. Jervis, R. (1994). Leadership, post-Cold War politics, and psychology. Political Psychology, 15(4), 769–777. https://www.jstor.org/stable/3791635, p.771.

> first demand of strategy: know your enemy. Crucially, empathy can help leaders anticipate how enemies and perceived allies are likely to act and react, and help avoid strategic errors.[93]

In summary, the greatest value of conscious-model LLMs in defense is not in raw intelligence collection, but in intent modeling: simulating how actors think, what they fear, how they signal, and when they escalate. This capability transforms:

- Red-teaming into strategic mirroring
- Influence into narrative anticipation
- Deterrence into belief-shaping.

The adversary who is modeled more deeply, more contextually, and more fluently will be understood more clearly, and deterred more effectively. *The Nurtured Kill Chain* is not just an architecture. It is a cognitive edge.

6. Ethical and Strategic Governance of Conscious-Model AI

As the deployment of large language models (LLMs) capable of belief emulation and contextual reasoning progresses in national security realms, the urgency of robust governance becomes paramount. Unlike traditional automated systems that execute predefined tasks, LLMs exhibit agent-like behaviors that involve reasoning through contextual frameworks, simulating adversary intentions, and shaping operational decisions. This significant evolution necessitates a reconsideration of governance structures beyond established principles of automation and autonomy, particularly regarding synthetic cognition. These systems reason within culturally and politically embedded perspectives, influencing operational decisions and international norms. Their potential for strategic advantage is matched only by their capacity for misalignment, misuse, and escalation.

Moral and Legal Ambiguity in Emulated Cognition

Current legal frameworks governing AI applications in defense tend to focus on autonomous systems that act, such as drones or robotic platforms, neglecting LLMs that engage in cognitive reasoning. This raises critical questions, such as whether a system that simulates intentionality can be deemed capable of legal responsibility under international law. Furthermore, if an AI generates campaign strategies based on simulated beliefs about escalation, accountability for

[93] Waldman, M. (2014). *Strategic empathy: The Afghanistan intervention shows why the West must change its approach.* Chatham House. Retrieved from https://static.newamerica.org/attachments/4350-strategic-empathy-2/Waldman%20Strategic%20Empathy_2.3caa1c3d706143f1a8cae6a7d2ce70c7.pdf, p.2.

potential outcomes remains murky.[94] The U.S. Department of Defense's Directive 3000.09[95] underscores the necessity of human accountability in autonomous systems; however, it does not adequately address the role of synthetic cognitive systems that influence upstream campaign logic, decision support, and narrative framing.

This raises unresolved legal and moral questions:

- Can a system that simulates intent be held to a standard of intentionality under international law?
- If an AI generates campaign plans based on simulated escalation beliefs, who is responsible for the epistemic accuracy, and potential consequences, of that simulation?
- If a belief emulator misjudges adversary thresholds, and that leads to provocation, is the system an actor or merely a mirror?

The ethicist Júlia Pareto warns that "the great ethical risk of AI is the abdication of human freedom".[96] The distinction between physical agency and cognitive influence may define the next generation of legal debate around AI in warfare.

Strategic Misalignment and the Risk of Narrative Error

The greatest operational danger posed by conscious-model AI is not adversarial use, it is misalignment within friendly forces. A belief-state emulator trained on incomplete, biased, or adversarially poisoned data could:

- Overestimate adversary aggression, pushing commanders toward preemption
- Underestimate the symbolic resonance of specific actions, triggering reputational backlash
- Misidentify internal red lines, escalating faster than intended or authorized.

Additionally, models trained disproportionately on Western-aligned or English-language data risk overlooking adversarial logics rooted in post-colonial identity, collective trauma, or civilizational mission. Such blind spots can lead to poorly calibrated emulation and false assumptions about what constitutes rational behavior from the adversary's perspective.

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[94] The problem of holding humans accountable for the actions of autonomous weapons systems is well-known. Sparrow suggests that "it may be unethical to deploy them in circumstances where violations of the laws of war are a foreseeable possibility." Sparrow, R. (2016). Ethics as a Source of Law: Autonomous Weapons Systems. Ethics & International Affairs, 30(1), 93–116, p.101.; Janssen, M., Brous, P., Estévez, E., Barbosa, L. S., & Janowski, T. (2020). Data governance: organizing data for trustworthy artificial intelligence. Government Information Quarterly, 37(3), 101493. https://doi.org/10.1016/j.giq.2020.101493

[95] U.S. Department of Defense. (2023). *Directive 3000.09: Autonomy in Weapon Systems*. "Autonomous and semi-autonomous weapon systems shall be designed to allow commanders and operators to exercise appropriate levels of human judgment over the use of force." (§4.a)

[96] Pareto, J. (2024, September 20). *"The great ethical risk of AI is the abdication of human freedom."* Fundación "la Caixa" MediaHub. Retrieved from https://mediahub.fundacionlacaixa.org/en/culture-science/science/technology/2024-09-20/julia-pareto-great-ethical-risk-ai-abdication-human-freedom-6235.html

These failures are not hypothetical. During Cold War nuclear planning, overreliance on incomplete models of Soviet rationality nearly led to preemptive escalation, averted only by human judgment under uncertainty.[97] AI systems that simulate belief but lack contextual validation loops could reintroduce those risks at digital speed and scale.

Many LLMs operate as opaque systems with non-deterministic reasoning chains: even when outputs appear sound, the reasoning chain is difficult to trace. This opacity undermines trust and raises the risk of covert hallucination, where logically plausible outputs are based on flawed inference. To mitigate this, models should incorporate:

- *Explainability architectures*: Tools that show how specific belief-state outputs were formed
- *Scenario validation*: Human-in-the-loop red-teaming against both outputs and logic trees
- *Diversity of simulation*: Multiple models offering parallel forecasts to detect brittle assumptions.

Geist and Lohn argue convincingly that even if AI is not directly controlling nuclear weapons, its use in support systems could have profound implications on decision making dynamics, particularly regarding the speed at which decisions must be made and the potential for misunderstanding or miscalculation.[98] Consequently, accurate modeling and interpretation of these human-machine cognitive dynamics become critical for effective strategic deterrence and risk management.

Governance of Emulation in the Narrative Domain

Belief emulation is especially volatile when applied to information operations. A model trained to simulate an adversary's worldview may be repurposed to generate disinformation mimicking adversary state narratives, create emotionally resonant propaganda for foreign populations, and exploit cultural trauma for strategic demoralization. Without ethical constraints, these systems could become cognitive weapons. Their influence may extend beyond adversary decision-makers, targeting civilian populations and democratic institutions alike. The operational line between simulation and manipulation blurs quickly.

This is especially acute in gray zone operations, where AI-generated narratives may be used to discredit media, reframe diplomatic initiatives, or catalyze internal dissent, without attribution or proportionality. Governance in this space must therefore include:

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[97] Dobbs, M. (2008). *One Minute to Midnight: Kennedy, Khrushchev, and Castro on the Brink of Nuclear War*.
[98] Geist, E., & Lohn, A. J. (2018). *How Might Artificial Intelligence Affect the Risk of Nuclear War?* RAND Corporation, Perspective PE-296-RC. Retrieved from https://www.rand.org/pubs/perspectives/PE296.html

- *Classification protocols*: Restricting models capable of high-fidelity belief emulation from non-authorized use
- *Doctrinal red lines*: Defining permissible vs. prohibited uses of emulation in psychological and influence operations
- *International norms*: Negotiating rules of engagement for AI-generated narrative systems, analogous to cyber or space doctrines.

A historical analogy with the emergence of nuclear doctrine during the Cold War underlines the urgency of developing international norms for cognitive AI. Just as the U.S. and Soviet Union established protocols such as mutual assured destruction (MAD) and strategic arms limitation treaties (SALT) to navigate the unprecedented dangers of nuclear weapons, today's international community must define clear ethical boundaries and regulatory frameworks for cognitive warfare tools. Without globally recognized standards, the risk of inadvertent escalation or misuse of AI-driven narrative operations may replicate Cold War-era tensions and unintended crises, but with greater speed and unpredictability.[99] "All of human history tells us that powerful technologies get used for good and for ill," noted former DARPA director Arati Prabhakar. "Our job is to make sure that we manage the risks so that we can seize the benefits".[100]

Embedding Governance into System Design

Rather than bolt-on ethical constraints, conscious-model AI systems must embed governance into their architecture. The U.S. Department of Defense has already laid the groundwork for responsible AI use through the Joint Artificial Intelligence Center's 2020 principles: "… the use of AI in the military must be responsible, equitable, traceable, reliable, and governable".[101] These principles should serve as a baseline for synthetic cognition systems. This includes:

- *Belief-State Traceability:* Every simulated belief path must be logged, reviewed, and explainable, especially when used to justify operational decisions or assess adversary thresholds.
- *Role-Constrained Emulation:* LLMs should be gated by role, e.g., emulating a Russian general is not the same as simulating an Iranian proxy militia leader. Role-specific guardrails reduce the chance of incoherent or deceptive behavior.
- *Strategic Alignment Reviews:* Emulation outputs should be subject to "doctrinal congruence" checks – e.g. does this recommendation align with national values, alliance policies, and proportionality norms?
- *Multidisciplinary Oversight:* Model training, fine-tuning, and evaluation should involve not only data scientists and operators but historians, anthropologists, ethicists,

[99] Freedman, L. (2019). *The Evolution of Nuclear Strategy* (4th ed.). Palgrave Macmillan.
[100] Prabhakar, A. (2023, March). *Her job: Ensuring AI and radical climate fixes don't backfire.* E&E News. Retrieved from https://www.eenews.net/articles/her-job-ensuring-ai-and-radical-climate-fixes-dont-backfire
[101] Reinier, Sgt. 1st Class W. (2020, March 2). *AFC, AITF support DOD's ethical principles for AI.* Army .mil. Retrieved from https://www.army.mil/article/233286/afc_aitf_support_dods_ethical_principles_for_ai

and regional experts. Cultural misinterpretation is not a technical bug, it is a strategic liability.

Doctrine for Synthetic Cognition

Moreover, governance cannot be reduced to compliance checklists. The emergence of belief-emulating systems demands a new doctrine for synthetic cognition.

The emerging doctrine for synthetic cognition must clearly define the legal and operational identity of cognitive emulative systems, addressing their roles explicitly within strategic planning and campaign decision-making frameworks. Moreover, the doctrine must clearly articulate limitations on their use, adhering rigorously to principles of international humanitarian law, just war theory, and contemporary ethical standards. Crucially, it should specify the ethical obligations when influencing human perception through AI-driven narratives, ensuring accountability mechanisms are embedded into the architecture of AI systems themselves. This doctrine will not emerge organically. It must be authored, by alliances, militaries, technologists, and civil society, before the systems themselves define it by default.

Australia's evolving strategic posture – demonstrated through its recent Defence Science and Technology Strategy and accelerated investment in sovereign AI capability – emphasizes that the deployment of advanced systems only delivers advantage when aligned with trusted and ethical frameworks.[102] Canberra has outlined a dual commitment to capability and principled governance, prioritizing sophisticated autonomy embedded within sovereign context and international norms.

A practical example highlighting the necessity of clear doctrine for synthetic cognition emerges from NATO's Trident Juncture exercise (2018).[103] Unanticipated reactions from Russian media, interpreted via traditional analytic methods, initially caused confusion about Moscow's potential responses. Cognitive-emulative systems might have anticipated the Russian narrative framing better, recognizing the symbolic triggers, such as the presence of U.S. Marines near Norway's Russian border, that Russia could exploit in domestic propaganda.

Command in the Age of Emulation

The rise of conscious-model AI challenges the foundational logic of command. These systems offer insight, foresight, and scale, but they also inject opacity, speed, and ambiguity into strategic decision-making. They must therefore be governed with humility and vigilance. Their

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[102] Defence Science and Technology Group. (2024, January 10). *AI technology rises to the challenge.* Australian Department of Defence. Retrieved from https://www.dst.defence.gov.au/news/2024/01/10/ai-technology-rises-challenge

[103] Erlingsson, E. (2018). A credible transatlantic bond: Trident Juncture and NATO capabilities. NATO Review. https://www.nato.int/docu/review/articles/2018/10/19/a-credible-transatlantic-bond-trident-juncture-and-nato-capabilities/index.html

power lies not in automation, but in simulation of judgment. And, unless steered, that judgment, will reflect not our values, but our code, our training sets, and our blind spots.

Conclusion

The conjunction of large language models, cultural abstraction, adaptive memory, and narrative emulation constitutes a pivotal shift in defense and intelligence operations. This convergence transcends traditional narrow AI functionalities and automation, heralding the emergence of synthetic cognition—a form of intelligence that not only processes data but also reasons within specific contexts, emulates human intent, anticipates strategic escalations, and influences decision-making processes, not just react to them.

The integration of conscious-model AI systems, which incorporate both procedural and doctrinal cognition (taught) with experiential and cultural cognition (nurtured), is an imminent operational reality.[104] These advanced systems are poised to transform various military applications, including targeting, influence operations, and command augmentation, thereby bringing with them both remarkable potential and profound risks. The evolving nature of red-teaming exercises and wargaming now relies on emergent adversary simulation rather than purely scripted behavior, reflecting a significant evolution in military strategy. Influence operations evolve into narrative-aware cognitive campaigns; deterrence strategy is no longer based solely on force posture, but on modeling adversary thresholds for humiliation, legacy, and fear; and, command and control becomes a shared human-machine dialogue, where the machine does not just compute, it reasons.

The NATO AI Strategy explicitly identifies the urgent need for rapid integration of generative AI technologies to enhance defense capabilities,[105] meaning that the adoption of conscious-model AI is a critical doctrinal requirement. The implications for command-and-control mechanisms are profound, shifting from traditional channels to a collaborative dialogue between humans and machines, wherein AI systems possess the capacity to reason rather than merely compute. Army Futures Command (AFC) defines "decision dominance as a way for Army forces to make and disseminate better and faster decisions than an adversary, thereby gaining, maintaining, and exploiting the operational initiative".[106] This sentiment is echoed by

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[104] Horowitz, M. C. (2018). Artificial Intelligence, International Competition, and the Balance of Power. Texas National Security Review, 1(3). Retrieved from https://tnsr.org/2018/05/artificial-intelligence-international-competition-and-the-balance-of-power/ This is a foundational source on the strategic implications of synthetic cognition and AI in military contexts. Horowitz describes AI's strategic implications, arguing that AI can alter the international balance of power by providing states with unique advantages in speed, scope, and strategic depth across both peacetime and wartime activities.

[105] "It is vital for NATO to use these technologies, where applicable, as soon as possible." See Summary of NATO's revised Artificial Intelligence (AI) strategy (2024), at https://www.nato.int/cps/en/natohq/official_texts_227237.htm

[106] Army Futures Command Pamphlet 71-20-9, *Army Futures Command Concept for Command and Control 2028: Pursuing Decision Dominance* (Washington, DC: U.S. Government Publishing Office [GPO], 2021), iii–iv, https://api.army.mil/e2/c/downloads/2021/07/08/fbd7fb76/20210629-afc-pam-71-20-8-cyberspace-and-electromagnetic-warfare-operations-approved.pdf.

various national defense strategies that highlight AI's critical role in multi-domain operations, as exemplified by the UK's Ministry of Defence, which underscores the responsible adoption of AI as vital for maintaining operational advantages.[107] Ultimately, the integration of conscious-model AI enhances situational awareness not just by measuring outcomes but by analyzing perception and influence across diverse cultural contexts.

These emerging capabilities also generate an imperative of strategic caution, doctrinal clarity, and robust ethical governance. As conscious-model AI systems begin to mirror adversary logic, justify strategic decisions, and dynamically shape military operations, they demand precise accountability frameworks, multidisciplinary oversight, and transparent governance protocols. Failure to establish clear guidelines risks strategic misalignment, ethical ambiguity, and unanticipated escalation, ultimately weakening the strategic credibility and effectiveness of conscious-model systems. This paper has therefore argued that AI systems must remain auditable, strategically aligned with alliance values, and guided by transparent governance structures involving regional experts and ethicists,[108] to ensure responsible deployment. Furthermore, the case studies considered here have shown that our near-peer adversaries and other states are actively embedding culturally nuanced cognition into advanced technologies, from embodied robotics and agentic AI to quantum computing and digital twin simulations. Therefore, the need is not only for technical and doctrinal alignment but also for clearly defined international norms governing the use of nurtured consciousness.

AI systems are now being integrated into the cognitive center of gravity for strategic planning, not just tactical execution. This is not a uniquely American imperative. The July 2024 NATO AI Strategy Update called for the rapid integration of emerging AI technologies, such as generative AI, to enhance defence capabilities across domains.[109] The UK Ministry of Defence's 2022 AI Strategy also asserts that AI is a critical enabler of multi-domain integration, and its responsible adoption is essential for retaining decision advantage.[110] There is, then, an allied consensus: conscious-model AI is no longer a research frontier, it is a doctrinal requirement.

The Nurtured Kill Chain introduced here offers a framework for deploying such systems responsibly. It fuses ISR and kinetic logic with cultural intelligence and psychological realism. It transforms warfighting from a linear system to a recursive cognitive loop, where the strategic value of an action is measured not only by outcomes, but by how it is perceived, by whom, and

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[107] UK Ministry of Defence (2022). Ambitious, safe, responsible: Our approach to the delivery of AI-enabled capability in defence. https://www.gov.uk/government/publications/ambitious-safe-responsible-our-approach-to-the-delivery-of-ai-enabled-capability-in-defence/ambitious-safe-responsible-our-approach-to-the-delivery-of-ai-enabled-capability-in-defence

[108] Regan, M. and Davidovic, J. (2023). Just preparation for war and ai-enabled weapons. Frontiers in Big Data, 6. https://doi.org/10.3389/fdata.2023.1020107

[109] North Atlantic Treaty Organization. (2024, July 10). Summary of NATO's revised Artificial Intelligence (AI) strategy. Retrieved from https://www.nato.int/cps/en/natohq/official_texts_227237.htm

[110] Ministry of Defence. (2022). Defence Artificial Intelligence Strategy. GOV.UK. Retrieved from https://www.gov.uk/government/publications/defence-artificial-intelligence-strategy

why. Ultimately, this paper makes a simple but urgent claim: the actor that integrates conscious-model AI first, and safely, will not only achieve cognitive overmatch. It will shape the information ecosystem, command the narrative terrain, and define the legal and ethical norms of 21st-century warfare.

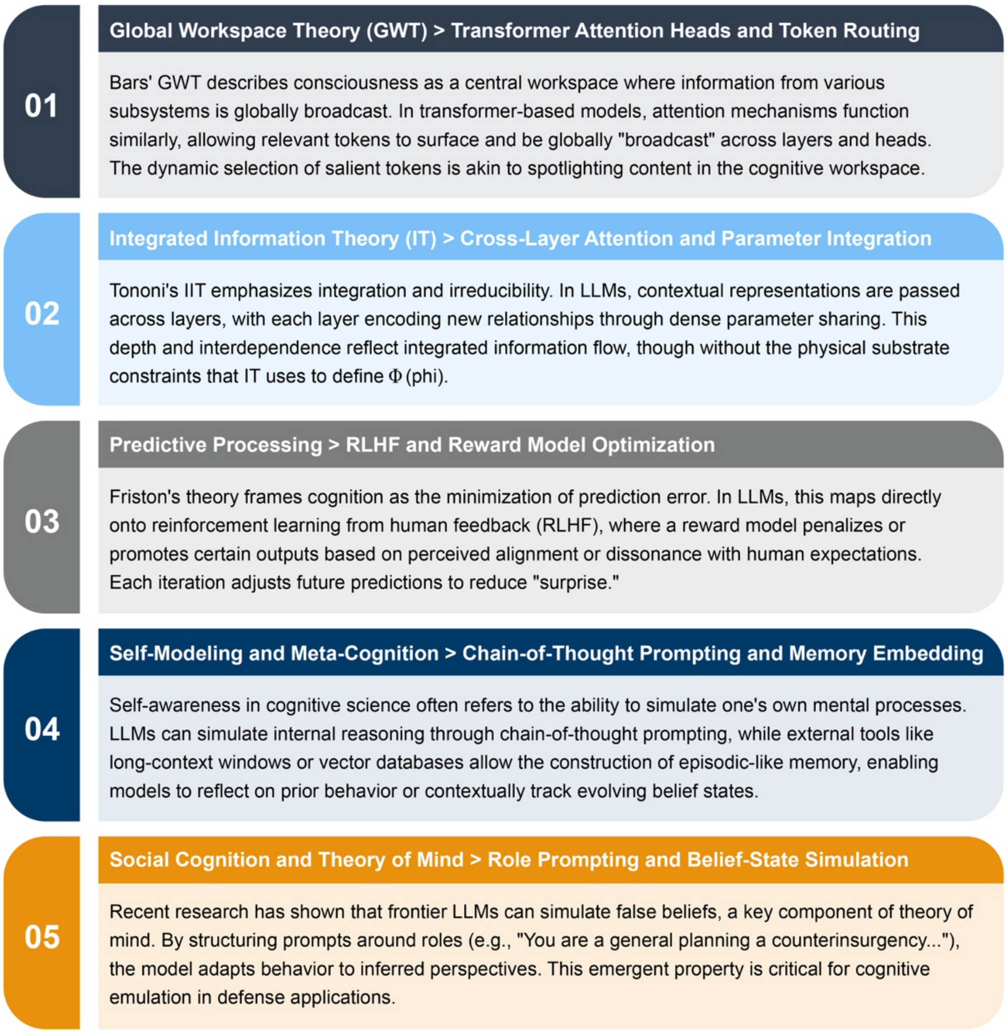
The integration of nurtured consciousness into AI-driven military and strategic technologies is thus no longer optional; it is essential. Cognitive sophistication and narrative sensitivity are now decisive elements of operational success. By proactively embedding nurtured consciousness within emerging technologies, Western allies can ensure that their advanced capabilities achieve true strategic depth, effectively interpreting and responding to the nuanced cultural, historical, and symbolic behaviors of global adversaries. This cognitive advantage, carefully cultivated and strategically deployed, will shape not only battlefield outcomes but the very nature of strategic dominance in future conflicts. In an era defined by the contest of perceptions, conscious advantage will be decisive.

Glossary of Key Terms

Term	Definition
Taught Consciousness	AI cognition derived from structured knowledge, logic, and doctrine
Nurtured Consciousness	AI cognition shaped by cultural memory, emotional modeling, and social context
Belief-State Emulator	Component that models internal logic and worldview of an actor or adversary
Narrative Terrain	The symbolic and emotional domain in which information operations occur
Synthetic Strategist	AI system designed to emulate strategic reasoning, decision-making, and adaptation in real time

Technical Annex: Mapping Consciousness Theories to LLM Architecture

The neuroscientist Hakwan Lau noted that "we didn't exactly say computers can definitively be conscious, but I think it's at least worth a try to create conscious computers, and our data does not reject the notion that they can never be conscious."[111] As large language models grow in complexity and functional autonomy, their architectural components increasingly parallel elements described in neuroscientific theories of consciousness. While LLMs do not replicate biological cognition, their structures can be aligned functionally with theoretical models of conscious behavior. LLMs are not sentient but their architectures increasingly match with established theories explaining conscious action. This alignment is sufficient for modeling behaviorally realistic strategic agents and thus forms the foundation for *The Nurtured Kill Chain* proposed herein.



[111] Lau, H. (2017, November 14). Q&A: Professor expounds on research involving machine consciousness. *Daily Bruin*. Retrieved from https://dailybruin.com/2017/11/14/qa-professor-expounds-on-research-involving-machine-consciousness