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To Offload or Not to Offload:

How AI May Alleviate Cognitive Burden and Related Ethical Reflections

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As the use of artificial intelligence (AI) continues to grow, many argue that it will not only allow humans to tackle tasks more efficiently and effectively, but that the technology itself will generally make life easier. Yet one of the more interesting and truly under-explored areas is how well AI can actually absorb human cognition; that is, going beyond simple decision-making assistance into actually "offloading" tasks and relieving cognitive burden, thus freeing up individuals to expand their mental capacity and creativity.

This Research Brief assesses various ways in which AI can alleviate cognitive burden on humans and, in high-level fashion, puts forth this notion across the healthcare, education and defense industries. It also raises several ethical ramifications and considerations when humans essentially offload this burden to machines, in part or in totality.

Introduction

Artificial intelligence is influencing industry and society in ways that were unimaginable just a few years ago. Many view this progression as worrisome or an uncontrollable movement that will have assured negative externalities, such as fewer jobs, increased misinformation and data misuse, or a loss of "human connection" (Pew, 2025). Conversely, many AI experts see these concerns in less dramatic ways (Pew, 2025) and point to numerous examples from fields such as healthcare and education where, for example, AI has sped up drug discovery (El Arab, et. al., 2025) or even enabled personalized learning pathways (The Economist, 2024).

Regardless of one's position, it is clear that AI is increasingly used in ways that can generally make people more "valuable" (PwC, 2025). From assisting with administrative tasks (e.g. calendar management) to creative writing (e.g. email assistance) to leisure-time recommendations (e.g. suggesting news posts or television programing) to discretionary funds distribution (e.g. targeting marketing), AI has been increasingly interacting with humans to ease various daily tasks.

The idea of deriving "value" from AI is two-pronged: first, when humans utilize AI capabilities in a harnessed and complementary fashion, they are usually—put simply—able to do things faster and more accurately. But a second, more curious function is when humans utilize AI capabilities to "free up" or create more mental space to focus on the task at hand. By passing off low value but cognitively draining tasks, AI can truly allow humans to focus their attention and working memory on more complex, creative or strategic tasks. In essence, if humans effectively use AI to *offload* some of their personal or professional cognitive burdens—or even more so to the state of complete automation without continuous user deliberation—they have more time to be resourceful, imaginative or productive.

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This Research Brief explores the emerging trend of using AI to manage cognitive burdens in everyday life and the ethical considerations that should accompany such tools.

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Cognitive Burden and Alleviation in Industry

Cognitive Burdens are not a new concept. For the purposes of this Research Brief, cognitive burden is defined similarly to the notion of "extraneous cognitive load". This term describes the demand on your working memory capacity imposed by distractions that are not directly relevant to what you are trying to do (Park, 2017). The term "burden" is considered more apt in the age of technological advancement, as the abundance of technology itself is seen as burdensome on humans, from feelings of inadequacy compared to technological capabilities, to the general ability of technology to form a distraction in and of itself.

Most scientific literature on this topic falls under "Cognitive Load Theory," or CLT, first coined by John Sweller in 1988. Sweller postulated that human working memory has limited capacity; therefore, when trying to boost the potential for effective learning, educational instructional design should be considered as highly critical for learning efficacy and further retention (Sweller, 1988). Sweller argues we should avoid overloading working memory to maximize learning, thus reducing unnecessary or "extraneous" loads while promoting more meaningful or "germane" ones. AI can either directly support learning, or indirectly free up time to create more space for learning endeavors, but the overall effect is similar, even if on parallel roads.

Given the relative novelty of AI tools in this space, an initial question is how the AI-enabled alleviation of cognitive burden manifests tangibly in the AI ecosystem today. To examine this, three important fields of application are assessed in the next sections: healthcare, education and defense. For each use case, the examination follows a framework that considers (1) decision-making, (2) administration and (3) human-centrism. Lastly, it is worth noting that each use case could be analyzed from more than one angle (for instance, in education, how AI is assisting in alleviating cognitive burden for either the healthcare provider, or equally, the patient). This Research Brief does not take a side but, where appropriate, explores in a multitude of ways.

Healthcare

The healthcare[1] industry deals in life-or-death scenarios. Therefore, the implications for how AI can automate routine tasks, filter data and even support reasoning ultimately allowing practitioners to focus their utmost attention on high-judgement, patient-centered care are enormous.

Consider AI's impact on **decision-making** in clinical settings. By streamlining information such as evidence-based histories, AI can quickly and efficiently analyze large volumes of medical data to improve speed and accuracy in differential diagnoses (i.e. a list of conditions or illnesses that could be causing symptoms) and even predict risks from procedures, such as relapses or sepsis. In specialty areas like pathology, dermatology, cardiology or radiology, AI is increasingly used to assist judgement in highlighting abnormalities and prioritizing high-risk findings. In fact, in a recent study published in Medicine, the authors found that within radiology and pathology alone, AI increased "accuracy and reduced diagnostic time by approximately 90%" when they assessed data from January 2019 to February 2024 (Jeong, 2025).

[1] We will simply apply "healthcare" as a comprehensive idea, though certainly AI's impact on each individual area is unique. "Healthcare" here is to include the medical side of the healthcare industry (commonly referred to as the "provider side"); the insurance industry (commonly referred to as the "payer side"); the biosciences industry (commonly referred to as the "research and development" side); and the pharmaceutical and medical technology industries (commonly referred to as the "commercial" side).

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Apart from decision-making, AI's ability to take on routine workloads and **administrative functions** across the healthcare industry has shown tremendous gains in recent years in auto-documentation, coding, workflow optimization and information retrieval and summary, amongst other critical areas (IEAI, 2021). The World Economic Forum noted that more than $10B in venture capital was invested in "health AI" in the United States in 2024 alone (WEF, 2024). Clinicians have successfully used AI to alleviate cognitive burden through "ambient listening" for automated clinical note generation, a required documentation step for medical providers in patient electronic medical records. Furthermore, AI can offload additional administrative stressors by predicting patient flow, prioritizing urgent care, sending lab test notifications and reminders, and providing key summaries in patient histories and physicals to reduce clinical fatigue (Boston College, 2025). The economic potential of using health AI is also quite significant; one of the leading recognized companies in the field is the Pittsburgh-based Abridge, valued at over $5B and used by more than 200 global healthcare entities (TechCrunch, 2025).

With respect to **human-centrism**, AI use can help alleviate cognitive burdens on healthcare practitioners and professionals—notably those that drive workplace fatigue—which critically helps ensure increased patient safety downstream. Technology has also been assisting with active patient-monitoring for many years, but today, AI, when trained appropriately, can help filter alerts more meaningfully and summarise time-bound care more efficiently. It can also, importantly, automate and help prevent adverse pharmaceutical interactions, dosing errors, and medication reconciliation (Cedars-Sinai, 2025).

Education

While the use of AI for alleviating cognitive burden in the healthcare industry has immense implications for physical well-being, arguably the most future-thinking area where AI can be used to offload cognitive burdens and create long-lasting benefit is in education. Through a combination of individualized, customizable education designs and supportive techniques, AI can hit the central tenets of CLT to maximize learning and retention. Consider even from the healthcare section above how AI can facilitate medical education, provide simulation-based training environments, or breakdown complex concepts on demand for clinicians. AI's positive attributes for the education field are widespread and potentially long-term.

AI's alleviation of cognitive burdens can energize instructors' abilities to put the human—the student—further at the center.

First, AI can assist **decision-making** in instruction through initiating individualized learning pathways. Contemplate the classroom: different students learn through different means, and models vary across the world. Here, AI's ability to guide learning and provide methods and resources tailored to varying individual needs and capabilities is imperative. The process of identifying what to study and, perhaps, how better to study (or comprehend more effectively) is worthwhile if students are not receptive to poor instructional design. Furthermore, AI can prioritize content, create visual interpretations to complement text and identify knowledge gaps. Excitingly, beyond the classroom, AI is proving extremely adept in modern learning styles with intelligent tutoring. By providing curated instruction, AI can offer more time and consideration for step-by-step explanations, adapt learning in real time, provide hints to combat misconceptions, adjust difficulty in real time and offer immediate feedback (Harvard, 2023).

Regarding the **administrative burdens** of education, teachers can use AI to fully grade assignments, identify trends and generate feedback (think old-fashioned fill-in-the-bubble answer sheets or computer exams, but for both objective and qualitative assignments). In parallel, AI can assist with lesson plan generation, attendance tracking, scheduling and parent and school communications. On the students' side, AI can obviously help focus on meaningful instruction by providing summaries of complex readings and assignments, highlighting key concepts, and assisting with the generation of educational artefacts (papers, presentations or even multimedia designs).

And, as in healthcare, AI's alleviation of cognitive burdens can energize instructors' abilities to put the **human**—the student—further at the **center**. AI can identify at-risk students earlier than teachers, predict learning "bottlenecks" or behavioral challenges, and boost long-term learning support for students with special needs, translation and accessibility, and emotional and motivational support (Techclass, 2025).

Defense

The third industry for exploration is national security or "defense." Defense could certainly be classified as the most precarious industry for cognitive burden offload analysis, given its implications for both global security and conflict scenarios. AI's interface with defense is often portrayed in high-risk, high-impact, worst-case scenarios, such as facilitating the navigation of autonomous weapon systems. But in reality, most often AI's functions in defense are for more boring and routine tasks, such as completing and processing paperwork (National Defense Magazine, 2025).

The use of AI for decision-making in the defense sector might be the most sensitive subject of this Research Brief. The most obvious case study is known by the acronym 'ATR', with the 'T' and 'R' representing "target" and "recognition" respectively, while the 'A' denotes either "aided", "assisted" or "automatic" depending upon the person or entity.[2] ATR is simply defined as "the use of computer

[2] Clearly, an argument can be made that each of these three terms means something different, both generally and with respect to the field of AI. However, for the sake of this Research Brief, we are merely pointing out existing differences in vernacular and uses within AI, but we will consider them the same.

processing to detect and identify targets" (MIT, 1989). By combining real-time imaging with historical data, machines have assisted humans with object identification in combat environments for decades. However, advances in intelligence gathering, imaging, algorithms, machine learning and more have made ATR both extraordinarily accurate and controversial.

Other AI-Driven Decision Support System (AI-DSS) processes within the global military context to alleviate cognitive burdens are equally interesting, albeit controversial. Tools to gather and analyze vast amounts of data, curate summaries and provide environmentally or contextually aware recommendations to field and non-field operators are becoming increasingly prevalent. Take, for instance, the U.S. Army's ATR-MCAS or ATR-"Mobile Cooperative and Autonomous Sensors". Per the Army:

"ATR-MCAS is an AI-enabled system of networked, state-of-the-art air and ground vehicles that leverage sensors and edge computing. The vehicles carry sensors enabling them to navigate within areas of interest to identify, classify and geo-locate entities, obstacles and potential threats which reduce the cognitive load on soldiers. The system is also capable of aggregating and distributing the target data, which can then be used to make recommendations and predictions based on the combined threat picture provided.

This ability to adapt to multiple performance standards provides increased situational awareness and presents soldiers with faster decision-making abilities. Additionally, this adaptable design increases soldier lethality and survivability by enabling soldiers to find, identify and track targets on the battlefield more swiftly" (US Army, 2020).

Just as healthcare providers and educators are, soldiers and defense-related civilians are extremely overworked and riddled with cognitive burdens. AI's ability to absorb repetitive **administrative tasks** from human operators in bases or on battlefields similarly enables them to focus more deeply within the aforementioned complex, high-stakes decision-making environment. Beyond high-level administrative tasks, and similar to other industries, undertakings such as ideation, data entry, evaluation processes, analytical support, report/briefing preparation or other forms of human-AI teaming are being used in the defense sector, and are gathering greater attention as of late, especially in the face of multiple ongoing global conflicts. In one specific use, AI is being explored to alleviate cognitive burdens via AI/ML-Enabled Autonomous Maneuver. Research and development are currently underway to use AI to assist in tactical battlefield maneuvering, boosting accuracy and freeing humans to focus on other tasks (U.S. Army SBIT-STTR, 2024).

AI can also be leveraged to enhance human-centric processes by improving training and education within the defense community, thereby alleviating cognitive burden and better preparing security personnel for operations.

In another instance of AI supporting automation, AI is relieving cognitive burden in Hull Mechanical & Electrical (HM&E) Machinery Control Systems (MCS). Automating systems and processes central to routine operations can improve robustness and survivability while also reducing staffing requirements (Barron Associates, 2023). To that end, predictive maintenance is additionally becoming more essential. A significant amount of time is dedicated each year to routine maintenance checks for military equipment, such as aircraft and helicopter inspections. As a result, not only are errors possible before, during or after such checks, but this process also removes individuals or teams from other possible important work. To that end, militaries around the world are also investing in AI systems to predict when best to service equipment, thus alleviating this cognitive burden (Global Defense Technology, 2024).

AI can also be leveraged to enhance **human-centric** processes by improving training and education within the defense community, thereby alleviating cognitive burden and better preparing security personnel for operations. The human-centered design of AI systems in the defense context supports a broad array of actions in logistics, analysis, planning, execution, etc., with a key focus on risk assessment,

mitigation and even de-escalation. Simulating realistic training environments and scenarios is quite challenging. Advanced human-machine interfaces (HMI), such as augmented reality (AR) curated to mission context and knowledge and operator workload, are an example of where AI can be utilized to improve humanitarian-related outcomes by better preparing soldiers to enter conflict zones. In another tactical example, AI is aiding defense personnel in security during long-duration missions through AI-powered image processing to enhance the quality of sensor inputs, such as thermal and night vision images (U.S. Army SBIT-STTR, 2024).

Ethical Considerations

How humans should interact with technology has been, is, and will be a wide-ranging and controversial conversation (look no further than dinner-table debates with children and screen time). But moving from "interacting" with technology to explicitly "relying on" or "offloading" part or almost all of a component of one's daily personal or professional life will likely escalate this discussion, have lasting effects and inspire deep ethical considerations.

This section delves deeper into the ethical issues surrounding AI's use to alleviate cognitive burden. A helpful frame of reference for viewing these issues is the core principles for a human rights approach to AI put forth by the United Nations Educational, Scientific, and Cultural Organization (UNESCO, 2021). Of the ten established principles, this Research Brief focuses on five: (1) Transparency & Explainability; (2) Right to Privacy & Data Protection; (3) Responsibility & Accountability; (4) Human Oversight & Determination; and (5) Fairness & Non-Discrimination.

Transparency & Explainability

Perchance, the first moral challenge to AI use in this space is that offloading a task or thought to an AI tool may reduce an individual's ability to independently *think*[3] or process information. What good can we humans offer to friends, family, colleagues or our communities if critical thinking is continually removed from our cognition, we ultimately deskill and thus our ability to explain our ideas, opinions and actions erode? From an ethical standpoint, one might ask how to prevent turning humans into pass-through communicators vs. original decision-makers? Or where can we encourage offloading without truly increasing work on other tasks, such as prompt engineering, which essentially increases cognitive burden?

According to UNESCO, ethical deployment of AI depends on it being both traceable and explainable, appropriate to the context. Further, privacy, safety and security are paramount. How, then, should we approach instances in which AI is embedded at the core of multiple technologies, as the Centre for International Governance of Innovation calls it, the "confluence"? (CIGI, 2024) When engaging (sometimes simultaneously) social media, generative AI websites, workplace productivity tools, virtual reality and [emerging] human-machine interfaces," AI can not only guide us in specific, unexplainable directions (manipulation or digital nudging as discussed later) but it can also impede original thinking quickly without tangible traces back. There is a fine balance to strike between utilizing AI as a cognitive complement and falling short on confidence, time, energy or originality.

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Right to Privacy & Data Protection

Next, apart from thinking for oneself, effectively offloading tasks requires providing AI tools with access to an individual's thoughts, feelings, impressions, behavior patterns, and, most worryingly, deeply personal preferences. For many, this is not a substantial problem. We often reap the few seconds we gain back in our days through sentence suggestions in our emails, our phone's GPS system recognizing similar geographical movements or tastes, and even how our voices and vocal patterns are recognized by voice assistants, chatbots and generative AI tools. But for others, the right to privacy

[3] Other operations here such as reason, logic, prioritize, argue, remember, problem-solve or—very importantly for this document, multi-task—are also included.

and data protection is of the highest priority. The levels at which humans are vulnerable to manipulation from emerging technologies like AI are still relatively unknown—but surely rising with technological advancements—and the voluntary (and involuntary) sharing of personal data or private details described above can reveal secrets, habits and health indicators, including mental state.

The central conundrum around cognitive liberty is how much of one's identity is sacrificed or lost—proactively or reactively—in the age of AI?

UNESCO's third published principle describing the right to "privacy and data protection" can creatively mirror "cognitive liberty", a term first coined by researchers Sententia and Boire (CCLE, 2003) and most recently popularized by Farahany in her book "The Battle For Your Brain: Defending the Right to Think Freely in the Age of Neurotechnology (2023). Sententia and Boire initially defined cognitive liberty as "the right of each individual to think independently and autonomously, to use the full spectrum of his or her mind, and to engage in multiple modes of thought". Farahany further defines cognitive liberty as "the right to self-determination over our brains and mental experiences, as a right to both access and use technologies, but also a right to be free from interference with our mental privacy and freedom of thought" (The Harvard Gazette, 2023). Though Farahany extends her research to include the seemingly innocuous example of common "wearable"[4] devices (McKinsey, 2023) she simultaneously notes the scary future scenario that emerging technologies will permit entities like employers and governments unwarranted and unfettered access to personal data like brain wave activity (Time, 2023).

As humans, logic posits we should be completely unencumbered to pursue private thought and free from worry about the exploitation of personal data or information. Yet even as far back as 1634, in a situation regarding external manipulation, a character in a John Milton story proclaimed: "[t]hou canst not touch the freedom of my mind" (Scientific American, 2017). Later, in 1913, the historian John Bagnell Bury penned: "A man can never be hindered from thinking whatever he chooses so long as he conceals" (Scientific American, 2017). Despite this Research Brief not attempting to explore the dual morality and legality of intrusions upon either privacy or related cognitive liberty, it does ultimately concede an unknown: as technology can continuously capture private data and simultaneously make it easier and more appealing for an individual to offload some cognitive burden, as well as makes it easier for external access to these burdens or even their manipulation, the central conundrum around cognitive liberty is how much of one's identity is sacrificed or lost—proactively or reactively—in the age of AI?

Responsibility & Accountability

Third, anyone who electively offloads various forms of cognitive burden to emerging technologies like AI must demand accountability and therefore understand how an AI system arrived at its recommendations, the order of its operations or even the actions it took. At times, understanding how fellow humans arrived at a decision or why they acted a certain way can be hard enough, so evaluating technological contributions for accuracy or efficacy, and then interpreting them (including how they arrived at those conclusions) is critical as well.

Demanding accountability for both our offloading of cognitive burdens and the actions taken by an AI system (or by humans with AI assistance) through "informed" control or consent is also crucial. In this instance, informed consent may be defined via the Cambridge Dictionary in that it is an "agreement or permission to do something from someone who has been given full information about the possible effects or results" (Cambridge). The challenge here remains where is the "human-in-the-loop", presenting questions about the balance between human and machine responsibility. Maintaining control and consent attempts to increase clarity and reduce ambiguity in parallel, and understanding a distribution amongst users, developers, deployers and

[4] Grouped in the larger category "Internet of Things" (or IoT).

technology governors. In other words, where does authority reside between humans and algorithms, especially in decision-making? Who is accountable when AI-supported offloads cause harm? Who is to claim glory when something goes right?

Contemplate this Research Brief's defense section: knowing that ATR is going beyond simple recognition, as it is being extended to tracking and even action suggestion, a recent Reuters/Ipsos poll showed that nearly one in two Americans stated AI should never be used to determine the target of a military strike (Reuters, 2025). In fact, the most extreme extension of this—lethal autonomy, or lethal autonomous weapons systems (LAWS), where weapons independently make decisions and engage—has its very own Department of Defense (DoD) Directive (DoDD 3000.09) to govern its usages and "minimize the probability and consequences of failures in autonomous and semi-autonomous weapon systems that could lead to unintended engagements" (DoD, 2023). In short, responsibility and accountability must be demanded.

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Human Oversight & Determination

Fourth, although it also references responsibility and accountability, UNESCO's ethical AI principle for "human oversight and determination" is fundamentally concerned with values, with human engagement in a technological future and with humans and technology directly. Here, two troublesome areas emerge when there is an overreliance on offloading cognitive burdens. Primarily, and we've seen this exponentially already, it upends the pervasiveness and normality of human-to-human interaction. This will decrease opportunities for collaborative, highly cognitive work and, more worryingly, human engagement in repetitive, rules-based, or rote tasks (e.g. administrative assistance, human resource management or entry-level accounting, legal or healthcare assistance).

Cognitive burden offloading may also unwillingly induce adverse hidden value judgements. Without targeted guidance, data and training, certain AI systems might already be structurally misaligned in some areas of human values, depending on development, task type, domain, user expertise or context. As a result, these AI systems may make recommendations or take actions that lead to unintended (or hypothetically catastrophic) outcomes for a person, entity, community or even larger society. For example, prioritizing efficiency over wellbeing, convenience over values, decreased stress over agency or ease over mental or physical harm.

Fairness & Nondiscrimination

Lastly, scholars are wrestling with both the internal and external ethical challenges an individual must comprehend as it offloads cognitive burdens to AI. Individuals must first acknowledge and subsequently calibrate that certain technologies may discriminate or even work better for certain linguistic, cultural or neurological profiles. When we offload burdens, *what* we offload, *when* we offload it, *how* we offload it, or if we are provided with the opportunity to explain, even *why* we offload it at all, all offer up personal preferences and chances for technology to absorb part of us.

This is especially true in the education sector, as exemplified in this Research Brief. Externally here, the beneficial opportunity for individuals to both learn about technology—as well as learn through a technology medium—will be rendered null if an AI tool, for instance, is intrinsically biased in its development or deployment. We must recognize the potential for these technologies to harbor inherent partiality against certain profiles, such as those with learning disabilities, or to attempt to resist or rebel against how an individual speaks, performs or conducts business. And this assumes all demographics have constant access or advanced knowledge and education about AI. An exponentially widening *digital* divide will likely lead to quicker or deeper *cognitive* divides in the long run. Especially when coupled with hybrid-work environments, this is proving to increase isolation and disengagement.

Conclusion

Generally speaking, "offloading" cognitive burdens onto an AI system is a nuanced proposition. This high-level Research Brief aimed to define cognitive burden, highlight how emerging technologies are being leveraged to alleviate it and illustrate examples across the **healthcare**, **education** and **defense sectors**.

AI can be harnessed in two distinct ways to increase "value": (1) a human joins forces in complementary fashion with AI to achieve a task in quicker, more accurate or perhaps previously unreachable ways; or, (2) a human leverages AI by offloading various cognitive burdens to free up memory or cognition so that they may focus on the higher-cognitive needs of a thought or process. This Research Brief weighed the potential for these uses within a framework of **decision-making**, **administrative tasking** and **human-centrism**.

Offloading a cognitive burden to an AI system isn't without ethical challenges. This Research Brief assessed the ethical considerations of this notion in light of **UNESCO's** core principles for a human-rights approach to AI. Safety, security, human rights and human values must all be thoughtfully considered and protected. To that end, safeguarding measures will be of utmost importance. As AI systems handle more sensitive data and assist with—or autonomously make—decisions, efforts must be made to prevent issues such as data poisoning, privacy breaches, hallucinations and more. Further, AI systems must be user-centric in design, should undergo ongoing monitoring and should have AI-specific security frameworks to review areas like data access controls and user vulnerabilities.

AI systems that are poorly integrated into daily personal life or professional workflows, lack clear user control, require constant supervision or produce opaque outputs tend to increase cognitive burden rather than reduce it. Whether offloading cognitive burdens to AI in an attempt to alleviate workload creates challenges for humans' thinking and problem-solving capabilities, decreases human engagement or widens new or existing cleavages, this disruption should be a catalyst for increased inclusive governance and ethical debate.

References

Barron Associates. (2023, August). Barron Associates awarded SBIT Phase I by the Navy for development of AI for shipboard machinery control systems. Available at: https://www.barron-associates.com/awards/barron-associates-awarded-sbir-phase-i-by-the-navy-for-development-of-artificial-intelligence-for-shipboard-machinery-control-systems/.

Boston College. (2025, April). The Future of AI in Healthcare Administration: Trends, Challenges, and Opportunities. Woods College of Advancing Studies. Available at: https://onlinemha.bc.edu/future-of-ai-in-healthcare-administration/.

Cambridge Dictionary. 'Informed Consent.'

Cedars-Sinai. (2025, April). AI Spotlights Medication Risks, Improves Drug Safety. Available at: https://www.cedars-sinai.org/newsroom/artificial-intelligence-spotlights-medication-risks-improves-drug-safety/.

El Arab. et. al. (2025, May). AI in vaccine research and development: an umbrella review. Frontiers in Immunology. Available at: https://www.frontiersin.org/journals/immunology/articles/10.3389/fimmu.2025.1567116/full.

Farahany, Nita. (2023, June). 'Cognitive Liberty' Is the Human Right We Need to Talk About. Time Magazine. Available at: https://time.com/6289229/cognitive-liberty-human-right/.

Farahany, Nita. (2023). The Battle for Your Brain: Defending the Right to Think Freely in the Age of Neurotechnology. St. Martin's Press.

Global Defence Technology. (2024, April). In pursuit of failure: US military and predictive maintenance. Available at: https://defence.nridigital.com/global_defence_technology_apr24/in_pursuit_of_failure.

Grimme, Thiemo & Hohma, Ellen. (2021, June). The Use of AI to Analyze Process-based Data in Hospitals: Opportunities, Limits and Ethical Considerations. Available at: https://ieai.sot.tum.de/wp-content/uploads/2021/06/ResearchBrief_June2021_Useof-AI-Prozess-Data-in-Hospitals_FINAL.pdf.

Harvard University. (2023, November). Better Feedback with AI? Graduate School of Education. Available at: https://www.gse.harvard.edu/ideas/usable-knowledge/23/11/better-feedback-ai.

Ienca, Marcello. (2017, May). Do We Have a Right to Mental Privacy and Cognitive Liberty? Scientific American. Available at: https://www.scientificamerican.com/blog/observations/do-we-have-a-right-to-mental-privacy-and-cognitive-liberty/.

Jeong, Jinseo et. al. (2025, February). Reducing the workload of medical diagnosis through AI: A narrative review. Medicine. 104(6). Available at: https://journals.lww.com/md-journal/fulltext/2025/02070/reducing_the_workload_of_medical_diagnosis_through.72.aspx.

Magnuson, Stew. (2025, February). Generative AI Used to Speed Up Defense Acquisitions. National Defense Magazine. Available at: https://www.nationaldefensemagazine.org/articles/2025/2/27/generative-ai-used-to-speed-up-defense-acquisitions.

Mavinkurve, Mai. (2024, January). Humanity's Cognitive Liberty Is at Risk: We Need to Recognize It. Centre for International Governance Innovation. Available at: https://www.cigionline.org/articles/humanitys-cognitive-liberty-is-at-risk-we-need-to-recognize-it-and-respond/.

McKinsey & Company. (2023, May). Interview: Author Talks: Can you use your 'brainpower' to defend cognitive liberty? Available at: https://www.mckinsey.com/featured-insights/mckinsey-on-books/author-talks-can-you-use-your-brainpower-to-defend-cognitive-liberty.

Mineo, Liz. (2023, April). Fighting for our cognitive liberty." The Harvard Gazette. Available at: https://news.harvard.edu/gazette/story/2023/04/we-should-be-fighting-for-our-cognitive-liberty-says-ethics-expert/.

Park, Babette et. al. (2017). Secondary Task as a Measure of Cognitive Load. Cognitive Load Measurement and Application: A Theoretical Framework for Meaningful Research and Practice. (pp75-92). Routledge.

Pew Research Center. (2025, October). How People Around the World View AI. Available at: https://www.pewresearch.org/global/2025/10/15/how-people-around-the-world-view-ai/.

PwC. (2025, June). The Fearless Future: 2025 Global AI Jobs Barometer. Available at: https://www.pwc.com/gx/en/services/ai/ai-jobs-barometer.html.

Reuters. (2025, August). Americans fear AI permanently displacing workers, Reuters/Ipsos poll finds. Available at: https://www.reuters.com/world/us/americans-fear-ai-permanently-displacing-workers-reutersipsos-poll-finds-2025-08-19/.

Sententia, Wrye and Boire, Richard Glen. Center for Cognitive Liberty & Ethics. Available at: https://www.cognitiveliberty.org/ccle1/faqs/faq_general.htm.

Sweller, John. (1988). Cognitive load during problem solving: Effects on learning. Cognitive Science. Volume 12, Issue 2. (pp 257-285).

Techclass. (2025, September). Using AI to Uncover Process Bottlenecks Across Departments? Available at: https://www.techclass.com/resources/learning-and-development-articles/using-ai-to-uncover-process-bottlenecks-across-departments?srsltid=AfmBOor-TzwZ7Lhz0zVcDmc3lbi34h6hUjlqvZLwT5Lt2IY1fnaevNaO.

TechCrunch. (2025). Available at: https://techcrunch.com/2025/06/24/in-just-4-months-ai-medical-scribe-abridge-doubles-valuation-to-5-3b/.

The Economist. (2024, January). AI can transform education for the better. Available at: https://www.economist.com/business/2024/01/11/ai-can-transform-education-for-the-better?utm_medium=cpc.adword.pd&utm_source=google&ppccampaignID=17210591673&ppcadID=&utm_campaign=a.22brand_pmax&utm_content=conversion.direct-response.anonymous&gclsrc=aw.ds&gad_source=1&gad_campaignid=17210596221&gbraid=0AAAADBuq3KwqsC7bT11nXWeoZQw5WRZr&gclid=CjwKCAiA95fLBhBPEiwATXUsxNCHxCz7O8VDdqaovKTX3RfdIU-aQDjlEDVDC8Ei5fLpk-qyk3--thoC2_oQAvD_BwE.

UNESCO. (2021). Ethics of AI. Available at: https://www.unesco.org/en/artificial-intelligence/recommendation-ethics.

U.S. Army. (2020, February). Aided Detection on the Future Battlefield. Available at: https://www.army.mil/article/232074/aided_detection_on_the_future_battlefield.

U.S. Army SBIR-STTR. (2024, December). AI/ML-Enabled Voice-Commanded Autonomous Maneuver for Ground Combat Vehicles. Available at: https://armysbir.army.mil/topics/aiml-enabled-voice-commanded-autonomous-maneuver-ground-combat-vehicles/.

U.S. Army SBIR-STTR. (2024, June). Lightweight AI-enabled image processing for Soldier-borne thermal imagers. Available at: https://armysbir.army.mil/topics/lightweight-ai-enabled-image-processing-soldier-borne-thermal-imagers/#:~:text=A244%2D048%20is%20a%20topic%20that%20seeks%20to,weight%2C%20power%2C%20and%20cost%20(SWAP%2DC)%20embedded%20hardware.

U.S. Department of Defense. (2023, January). DoD Announces Update to DoD Directive 3000.09, 'Autonomy In Weapon Systems.' Available at: https://www.war.gov/News/Releases/Release/article/3278076/dod-announces-update-to-dod-directive-300009-autonomy-in-weapon-systems/.

Verly, J.G. et. al. (1989). Machine Intelligence Technology for Automatic Target Recognition. The Lincoln Laboratory Journal. MIT. Volume 2, Number 2. (pp 277-311).

World Economic Forum. (2024, November). Billions of dollars have been invested in healthcare AI. But are we spending in the right places? Available at: https://www.weforum.org/stories/2024/11/healthcare-health-ai/.