

About the Defense AI Observatory

The Defense AI Observatory (DAIO) at the Helmut Schmidt University in Hamburg monitors and analyzes the use of artificial intelligence by armed forces. DAIO comprises three interrelated work streams:

- Culture, concept development, and organizational transformation in the context of military innovation
- Current and future conflict pictures, conflict dynamics, and operational experience, especially related to the use of emerging technologies
- Defense industrial dynamics with a particular focus on the impact of emerging technologies on the nature and character of techno-industrial ecosystems

DAIO is an integral element of GhostPlay, a capability and technology development project for concept-driven and AI-enhanced defense decision-making in support of fast-paced defense operations. GhostPlay is funded by the Center for Digital and Technology Research of the German Bundeswehr (dtec.bw). dtec.bw is funded by the European Union – NextGenerationEU.

Ein Projekt im Rahmen von



Fragmented Efforts

Defense AI in Brasil

João Paulo Moralez and Santiago Rivas

DAIO Study 26|34

Ein Projekt im Rahmen von

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Zentrum für Digitalisierungs- und
Technologieforschung der Bundeswehr



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Acknowledgments

The authors would like to thank Joaquín Rivas, the Brazilian Army, and Brazilian Navy for their support.

Imprint

Fragmented Efforts. Defense AI in Brasil. DAIO Study 26/34
(Hamburg: Defense AI Observatory, 2026).

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ISSN (online): 2749–5337

ISSN (print): 2749–5345

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1 Executive Summary

Although Brazil has one of the most developed Armed Forces in Latin America and the most significant defense industry on the subcontinent, the country lacks a consolidated vision for the development of Artificial Intelligence (AI) in the defense domain, with only a few limited initiatives within the Armed Forces and little integration between them.

This, however, is not an exception in Latin America, where the development of AI in the defense field is, incipient at best and largely non-existent in smaller forces. The lack of political interest in defense across the region, mainly due to the absence of conventional conflicts and the fact that Latin America is considered a “zone of peace,” has reduced defense investments over the past 40 years to around or below 1% of GDP. This reality has slowed technological defense development. Although public figures on defense AI spending are hard to come by, initiatives like the creation of the LabIA by the Air Force suggest that annual military spending on AI is in the low one or two-digit million dollar range.

Within this context, AI currently shows very limited and slow progress in its military application, both in Brazil and across the rest of Latin America.

Nevertheless, Brazil’s armed forces are gradually adopting AI. Overall, the Army, Air Force and Navy are considering AI primarily for assistant and supportive functions, while making sure that human operators cede as little decision-making power to AI as possible. The three services have put significant effort into setting up governance frameworks that ensure the responsible use of defense AI in full compliance with national and international regulations.

Resource constraints and an underdeveloped institutional set-up, as well as the lack of qualified personnel currently, constitute the main obstacles for more advanced uses of defense AI in Brazil. Thus, current defense AI development priorities are limited. The Army is mainly looking at AI for data analysis, the Air Force is focusing on AI for maintenance, fleet management, and the analysis of satellite and drone imagery, and, finally, the Navy is exploring AI to enhance logistical support. So far, cross-service cooperation to advance AI is limited. In addition, Brazil's emphasis on national sovereignty that limits data sharing constitutes a challenge for international cooperation on defense AI.

Similarly current applications of defense AI in Brazil's military services are limited as well. The Army uses AI in systems built to respond to public requests and to support cyber defense. The Air Force is primarily using AI for air defense, search and rescue missions, and logistics, while the Navy is using algorithms in decision support mechanisms, cyber defense and electronic warfare. In addition, AI is also part of Brazil's SIFRON border security program.

Although all three services are using AI for wargaming and simulation-based training, proper initiatives to prepare the defense workforce for the future use of AI have yet to emerge. Rudimentary introductory courses have been launched but more remains to be done to make sure that Brazil's emphasis on the responsible use of AI in the military domain is backed up with defense personnel who understand the technology and make informed decisions about its use for military tasks.

2 Thinking about Defense AI

Different drivers shape force transformation in general and the adoption of new concepts and technologies in particular. Unlike other countries, Brazil is neither facing imminent military conflicts nor ongoing war. External threat as a force to update the country's defense posture is relatively weak. Nonetheless, artificial intelligence (AI) and other technologies have begun to play a role in the routine activities of certain segments of the Brazilian Armed Forces. It is important to emphasize that this role is assistive and supportive in nature, without assuming tactical or offensive functions.

2.1 Budgetary Constraints Limit Strategic Thinking

The budgetary constraints faced by Brazil and the South American continent impose limitations not only on the acquisition and modernization of equipment, but also on broader thinking about the future. While there is a recognized need to equip the Armed Forces with disruptive technologies, priority is given to resolving immediate and urgent problems before addressing future requirements.

Currently, Brazil faces a modernization backlog. There is a continuing requirement to equip the forces with medium- and high-altitude air defense systems, data links and network-centric systems, attack drones and other capabilities before any meaningful planning for multi-domain operations can take place. In parallel, the acquisition of fighter aircraft, frigates, submarines, border surveillance systems, main battle tanks and other systems is heavily delayed, often due to payment shortfalls. Once these systems reach operational units, the underlying technologies are outdated. As a result, modernization programs are required to bring them up to current technological standards.

Although senior leadership and the General Staff plan for the use of disruptive technologies, the need to maintain and equip forces with basic capabilities ultimately postpones future-oriented capabilities, often without any clear timeline for implementation. This situation challenges capability development and has so far prevented Brazil's Armed Forces to come up with strategic plans on what to expect of defense AI and how to prepare for its adoption.

2.2 Weak Reference to Defense AI in National Capstone Documents

In 2026, Brazil will mark the 30th anniversary of the National Defense Policy (PND), a document created in 1996, at a time when the Ministry of Defense did not yet exist as a central authority and when each military service (Army, Navy and Air Force) had its own minister and operated independently.

The PND was established to guide the efforts of Brazil's society towards consolidating national capabilities and developing the conditions necessary to guarantee the country's sovereignty, territorial integrity and the fulfilment of national objectives. It therefore defines how the Armed Forces must act in relation to the national and international defense context and its geopolitical environment. Promoting technological and production autonomy in the defense sector is one of the policy's eight objectives.¹

In addition to the PND, two other documents define Brazil's political framework for defense. The National Defense Strategy (END) defines how the Armed Forces must implement the guidelines of the PND, involving National Power, national defense capabilities and the Defense Industrial Base (BID).² In addition, the National Defense White Paper is broader in scope and addresses various issues, such as the strategic environment, the need to modernize the Armed Forces, the rationalization and adaptation of defense structures, peacekeeping and humanitarian assistance operations, and national economic support for defense.³

Together, these three documents are updated every four years. The penultimate update took place in 2016, while the 2020 version suffered delays in approval and was only released in 2024, being finally consolidated in 2025. This negligence reflects the fact that various Brazilian governments have considered defense a low priority for decades. But despite the delay, the most recent update did mention, albeit cautiously, AI as a disruptive technology which, together with virtual and augmented reality and quantum computing, "accentuates asymmetries in the defense domain, influencing the balance of power between countries." In addition, "promoting the development of artificial intelligence for National Defense"⁴ is mentioned as one of the strategic defense actions.

Against this background, Brazil has undertaken first steps to use AI for defense purposes as the following chapters will illustrate. These discrete moves have been driven by strategic documents. In April 2024, the "Strategic Directive on Artificial In-

1 Política Nacional de Defesa – Estratégia Nacional de Defesa.

2 Política Nacional de Defesa – Estratégia Nacional de Defesa.

3 Defense White Paper.

4 Decreto Nº 12.725.

telligence for the Brazilian Army” was approved through Ordinance C Ex No. 1,318.⁵ This is the first document issued by a service branch to specifically address the application of AI, establishing objectives to integrate AI into the Army Information System (SINFOEx) and the Land Operational Information System (SINFOTER). The document emphasizes the use of AI in land operations, logistics and decision-making support, while also highlighting the need to master emerging technologies to increase operational efficiency and preparedness for modern conflicts.

In parallel, the Brazilian Congress continues to work on Legal Bill No. 2338 of 2023, which aims to regulate the development and use of AI in Brazil. The proposal establishes a set of rules that companies in the defense sector must follow and defines how technology will be monitored. The bill is currently awaiting approval by the Chamber of Deputies.⁶

One of the main innovations put forward because of this bill is the creation of the National Artificial Intelligence Regulation and Governance System (SIA), responsible for establishing subsequent regulations and overseeing compliance with the rules. The bill defines technologies considered to be high-risk, which will be subject to stricter regulation. These include systems that may cause harm to individuals or society, such as autonomous vehicles or biometric identification systems. In addition, it prohibits the use of autonomous weapons and tools employed by public authorities to assess or classify individuals for access to goods and services.⁷

2.3 Challenges to Advance the Use of Defense AI

AI is being gradually introduced into the Brazilian Armed Forces through different pathways.⁸ Internally, the development of new tools is carried out by military personnel who create solutions to meet their own demands, whether administrative or routine in nature, as exemplified in chapter 6. AI has also become part of the daily routine of many individuals who use different tools on their own initiative — whether to review documents, produce summaries, generate images for presentations or address other administrative requirements. However, when it comes to tactical, operational or strategic decision support, AI is still regarded as a technology to be applied in the future.⁹

5 Diretriz Estratégica de Inteligência Artificial para o Exército Brasileiro.

6 Bill Project PL 2338/2023.

7 “PL do governo propõe sistema de governança para a inteligência artificial no país” (Government bill proposes Governance system for artificial intelligence in Brazil).

8 The following paragraphs build on feedback from the Brazilian Army and the Brazilian Navy in response to questions submitted by the authors. The Brazilian Air Force did not respond.

9 In this regard it is also worth noting that the services enjoy high degrees of freedom in defining the future development trajectories, as illustrated by the Navy Strategic Plan 2040, the Navy Strategic Portfolio, the Air Force Military Strategic Plan, the Air Force Strategic Concept 100, the Army Strategic Plan (PEEx) and the Army’s Força 40 program.

■ Army Perspectives

The Army recognizes AI as a tool that may become a major asset in the decision-making process at all levels. Its corporate use will occur both in operational and administrative contexts, contributing to facilitating and accelerating the analysis of data essential to the Force's activities. At present, AI is already being used in support of administrative activities through proprietary and adapted LLM models; in cyber security; in various studies conducted in the academic field of science and technology through the Military Engineering Institute and other military organizations linked to research and development; as well as in the operational domain, which has also been employing proprietary LLM models focused on decision-making processes.¹⁰

There are two major challenges the Army and Brazil's Armed Forces in general face to disseminate AI. First, technological resources are very limited and thus not available at sufficient scale to cover as many personnel and organizations as possible, enabling effective use, provide feedback, and adapt existing and develop new concepts and doctrines. In addition, there is an organizational requirement to create centers that can generate and disseminate adequate knowledge on AI. "Over the next five years, priorities include the acquisition of adequate infrastructure, improvements to data centers, continuous personnel training and the development of proprietary AI solutions, both for operational and administrative applications,"¹¹ the Army contends.

Second, there is a cultural challenge that stems from the fact that personnel—especially more experienced staff and military leaders operating at higher hierarchical levels—need to adapt before being able to adopt the technology in operational contexts. The Army states that

there are relatively few personnel qualified to work directly on AI development. However, the Army has been offering courses at different levels with the aim of enabling users to correctly employ these tools. In the fields of ethics and reliability, the Force has formal guidelines, such as the Strategic AI Directive of the Brazilian Army, the Regulation of the Artificial Intelligence Governance Committee, and the establishment of a specific working group to structure AI governance and management within the Army General Staff.¹²

¹⁰ Brazilian Army. Official response to the questionnaire submitted by the authors regarding the use of artificial intelligence within the Army, 17 November 2025.

¹¹ *Ibidem*.

¹² *Ibidem*.

■ **Navy Perspectives**

The Navy faces similar challenges particularly in terms of infrastructure and training, compounded by budgetary constraints. Culturally, as witnessed in the civilian sector, there is a need to recognize AI as a tool that supports human operators in executing tasks rather than acting on its own. People have frequently sought to identify a single “best” AI technology to address multiple day-to-day professional demands, whereas experience shows that each software solution has its own strengths and weaknesses and that, in many cases, it is necessary to combine several tools to achieve the desired results. Overall, the Navy argues:

The technical challenges identified relate to training, infrastructure, decision support and the governance of AI systems within the Brazilian Navy. Each of these areas presents financial, human resources and legal challenges that must be overcome. In the cultural domain, the challenge lies in recognizing AI as a support tool rather than as a direct problem-solving instrument. In addition, one of the main concerns is protection against cyber threats, an area in which the Navy has been improving in step with current technologies.¹³

Each of the services faces domain specific challenges. But solutions meant to address these challenges need to converge to advance joint capability development as required by Brazil’s strategic capstone document. Right now, however, capability development is underdeveloped as the respective concepts, processes and institutions that would help to synchronize the three military services are lacking.

¹³ Brazilian Navy. Official response to the questionnaire submitted by the authors regarding the use of artificial intelligence within the Naval Force, 19 December 2025.

3 Developing Defense AI

Currently, a coherent picture about Brazil's defense AI development priorities is not available. This is a consequence of the country's relatively fragmented force development approach in which the services mainly operate on their own. Therefore, different lines of effort exist next to each other:

- **Army**

The Army, through its Department of Science and Technology, has sought to establish agreements and partnerships with public and private institutions to develop and promote AI initiatives. Among other partners, the Army is cooperating with the Brazilian Funding Authority for Studies and Projects (FINEP), which supports projects developed by the service that are also relevant to the civilian market. Army activities primarily focus on developing AI solutions for enterprise applications, which will encompass both operational and administrative frameworks, contributing to streamlining and accelerating the analysis of data essential to the Army's activities.

- **Air Force**

In August 2025, the Brazilian Air Force, in cooperation with the Casimiro Montenegro Filho Foundation, inaugurated LabIA, its first AI laboratory.¹⁴ The lab is focusing on large language models (LLMs) and the processing of large volumes of data. In its initial phase, it will concentrate its efforts on optimizing aircraft maintenance using intelligent algorithms (particularly for the Gripen E/F fighters and the KC-390 transportation aircraft), fleet management, the analysis of satellite and drone imagery to locate targets on the ground, combat training, and cyber security.

- **Navy**

The Navy's primary interest is in using AI to enhance logistical support, particularly regarding life-cycle management. Beyond this focus, the service welcomes different types of partnerships aimed at improving processes and solving problems with AI to support administrative tasks, education, training, personnel management, maintenance, supply chain management, unmanned vehicles, decision-making processes, operational intelligence, maritime traffic, search and rescue operations, and cyber defense.

Service-specific development activities underline that it is too early for the Brazilian Armed Forces to scale the use of AI for joint tasks, as current efforts are too preliminary and require extensive testing and comprehensive doctrinal adjustments. Cross-service cooperation might occur to advance exchanges of knowledge but is

¹⁴ "CCA-SJ assina convênio inédito na área de Inteligência Artificial" (CCA-SJ signs unprecedented agreement in the field of Artificial Intelligence).

still very limited. This also holds true for research cooperation with foreign partners as information is protected for reasons of national sovereignty.

Brazil's emphasis on national sovereignty in the field of AI, however, is likely to create challenges as the country is about to receive new defense equipment from foreign partners. A strong emphasis on sovereignty might deprive Brazil and the Brazilian defense industry from access to the respective technologies and could hinder the transfer of expertise. For example, it is unclear to what extent Brazil will benefit from AI-enhanced electronic warfare suites that Sweden's Saab Gripen E provides, even though Brazil could plug into the fighter's open architecture approach.¹⁵

It also remains to be seen how Brazil's defense companies will adjust to the use of AI and to what extent their priorities will be driven by the requirement of Brazil's Armed Forces or export opportunities. Embraer, for example, has been investing in the use of AI for inventory management. In addition, the company has set up the New Technologies Demonstrator Platform for which a test aircraft is used to insert or integrate new technologies. This initiative is intended to test the feasibility of medium-maturity technologies, systems and tools, identify their potential applications and allocate them to specific projects.¹⁶

In general, industry and academia are two strong and structuring pillars in Brazil. They are present in significant numbers and possess the quality required to support the government in both its immediate and long-term actions. But Brazil's fragmented approach to developing AI for military applications also makes it difficult to leverage their expertise at scale. Consequently, defense demand signals that could trigger more robust industrial and academic initiatives are missing, even though some universities and research centers have promoted AI research. Overall, Brazil occupies only intermediate positions in international rankings such as no 15 in the number of AI-related articles, no 8 in the number of authors, but only on rank 23 in citation impact, indicating a more quantitative than qualitative approach.¹⁷

In sum, preparing Brazil's ecosystem for the advent of AI and the need to develop indigenous solutions remains most challenging. Initiatives that help advance collaboration and knowledge transfer among ecosystem partners are thus even more important. In this regard the activities of the Ezute Foundation and the Getulio Vargas Foundation are particularly noteworthy, as these institutions have started to position the development of AI and digital technologies as key enablers of the

15 Newdick, "Saab's Gripen Tests AI In Long-Range Air-To-Air Engagements."

16 Zapparoli, "Quarta mais inovadora, Embraer tem um avião só para testar novas tecnologias" (The most innovative aircraft manufacturer, Embraer has an aircraft dedicated to testing new technologies).

17 Índice Latinoamericano de Inteligencia Artificial (Latin American AI Index).

“Navy of the Future,” for example. The Navy has started to complement these activities with events such as the Aratu Maritime Unmanned Systems Simulation 2025 (ARAMUSS-2025). Organized at the Aratu Naval Base the event brought together naval stakeholders, industry, and researchers and was instrumental in providing practical demonstrations of unmanned maritime, underwater and aerial systems, particularly those focused on mine warfare and the potential use of AI.¹⁸

¹⁸ “ARAMUSS-2025: evento pioneiro de tecnologia marítima não tripulada é encerrado em Salvador e aponta para o futuro” (Pioneering unmanned maritime technology event concludes in Salvador and points to the future).

4 Organizing Defense AI

The Brazilian Artificial Intelligence Strategy (EBIA), formulated by the Ministry of Science, Technology and Innovation (MCTI), emphasizes digital transformation, talent development and ethics in the use of AI, but leaves sectoral implementation to each ministry. Along these lines and absent a unifying defense AI strategy, Brazil's three military services are developing very different governance solutions to advance the use of defense AI. All services put major emphasis on the responsible use of defense AI and full compliance with national and international legal requirements.¹⁹

4.1 Army

The Army has been a pioneer with its 2024 directive, which establishes principles for the implementation of AI in intelligence, logistics, and operational domains. This directive emphasizes the need for human control in line with national policies such as the National Information Security Policy (Decree No. 9,637/2018). Accordingly, the Brazilian Army is the first service to have its own specific directive governing the use of AI.²⁰ Its primary objective is to establish strategic guidelines for the implementation and use of AI within the Brazilian Army, aligned with the Army's Information Policy. The document also highlights the need to master emerging technologies to ensure state security and preparedness for modern operations, especially considering the global context of technological competition.

The directive provides a regulatory framework to integrate AI into the Army Information System (SINFOEx) and the Land Operational Information System (SINFOTER), promoting its ethical and efficient use in land operations, logistics, decision-support activities, and surveillance. The directive seeks to enhance the Army's operational capability in the face of asymmetric and cyber threats, without replacing human judgement in critical decisions.

The directive applies to all Army bodies involved in the development, acquisition, and implementation of AI systems. It includes systems focused on specific tasks and exploratory initiatives towards more complex AI, with an emphasis on human control. Exceptional cases not covered by the directive will be assessed by the Army General Staff, and any omissions will be resolved by the Chief of the General

¹⁹ As Brazil strives for legally binding obligations for use of AI the country has not signed up the declarations of international non-binding initiatives like the Responsible Use of AI in the Military Domain (REAIM).

²⁰ Strategic Directive on Artificial Intelligence for the Brazilian Army (EB20-D-02.031), the first edition of which was approved through Ordinance C Ex No. 1,318, issued on 14 April 2024 by the Chief of the Army General Staff (EME), Army General Richard Fernandez Nunes. This ordinance is based on the powers conferred by item X of Article 4 of the Regulation of the Army General Staff (EB10-R-01.007), approved by Ordinance of the Army Commander No. 1,780 of 21 June 2022. The directive entered into force on 24 May 2024 and was published in Army Bulletin No. 21 of the same date.

Staff. The directive establishes guiding principles for the development and use of AI, ensuring alignment with institutional values and ongoing regulatory efforts:²¹

- **Ethics and Morality:** Compliance with ethical principles and the Army's moral values must guide all AI system development. The use of AI in lethal decision-making without human supervision is implicitly prohibited, requiring rigorous evaluation of autonomous systems.
- **Security and Confidentiality:** Integration with regulations such as the National Information Security Policy (Decree No. 9,637/2018) and the General Instructions for the Safeguarding of Classified Matters (IGSAS – EB10-IG-01.011).
- **Operational Efficiency:** AI should enhance decision-making, predictive analysis and logistical optimization thereby reducing risks to personnel.
- **Responsible Innovation:** Promotion of technological “leapfrogging,” encouraging research and development (R&D) in collaboration with universities and the private sector, in alignment with the Brazilian Digital Transformation Strategy (E-Digital, Decree No. 9,319/2018 and MCTIC Ordinance No. 1,556/2018).
- **Human Control:** Emphasis that any AI system that does not allow human intervention in critical decisions (especially those that may result in loss of life) will be subject to rigorous evaluation by the Army General Staff (EME).

To implement its directive, the Army puts particular emphasis on the following instruments:²²

- **Assessment and Prioritization:** The Army has established committees within the Army General Staff (EME) to evaluate and prioritize AI projects in alignment with the Army Strategic Plan (PEEx).
- **Training:** AI training programs for officers and technical personnel shall be integrated into the Systems Development Center.
- **Agile Development:** The Army wants to adopt agile prototyping methods with an emphasis on ethical and cyber security testing.
- **Monitoring:** The Army wants to define performance indicators – such as the time saved to conduct intelligence analyses with AI, for example – to assess the performance of AI

Building on its directive, the Army started a three-phased process by establishing an inventory of current AI capabilities in 2024 (diagnosis phase). The consecutive development phase, which lasts until 2027, will integrate AI into systems like SISFRON and into Army logistics solutions. In parallel, annual reviews conducted

²¹ The directive is also grounded in a broad legal and strategic framework including, for example, the Brazilian Army Operational Concept (COEB 2040 – EB20-MF-07.101), the Army Information Policy and the 2012 National Defense White Paper.

²² Diretriz Estratégica de Inteligência Artificial para o Exército Brasileiro.

by the EME will help to stay the course and undertake adjustments to national and global developments.²³

Overall, this directive represents a significant step forward for the Brazilian Army, and positions the service within the global debate, albeit with a conservative approach in terms of ethics and human control.

4.2 Air Force

The Brazilian Air Force maintains the Aeronautics Computing Centre in São José dos Campos (CCA-SJ),²⁴ which acts as a hub for the dissemination of knowledge and doctrine and fulfils the operational role related to information technology, simulation and software development. It is subordinated to the Department of Aerospace Science and Technology (DCTA) and has been increasingly engaged in initiatives related to AI as part of the FAB's broader digital transformation and modernization efforts.

One of its main milestones was the establishment of the first AI laboratory within the Brazilian Air Force, created through a cooperation agreement with the Casimiro Montenegro Filho Foundation and other partners. This laboratory focuses on developing and applying AI solutions to improve logistics management, document processing and administrative systems aiming to enhance efficiency, decision support and information management within the Air Force. A key initiative under this effort is the Inteligência Logística com Inteligência Artificial (ILOG-IA) project, which applies advanced AI capabilities, including automated analysis and contextual text processing, to optimize logistical workflows and documentation processes.

In addition to technological development, the CCA-SJ also plays an important role in fostering knowledge and integration, having organized events such as the FAB AI Seminar, bringing together military, academic and industry stakeholders to discuss challenges, opportunities and operational applications of AI in the defense domain.

²³ Diretriz Estratégica de Inteligência Artificial para o Exército Brasileiro.

²⁴ "FAB aposta em Inteligência Artificial para eficiência, segurança e inovação tecnológica" (FAB invests in Artificial Intelligence for efficiency, security, and technological innovation).

4.3 Navy

The Brasilia-based Army Cyber Defense Command, which operates jointly with personnel from the Air Force and the Navy, is responsible for monitoring and countering threats against the computer systems of critical and vital national infrastructure, such as energy, sanitation, communications, financial, healthcare and other networks. It employs AI both to provide continuous protection and to conduct war games.

The Naval Systems Analysis Centre (CASNAV) is the Navy's principal hub for software development, computational intelligence, information technology and systems analysis. CASNAV supports naval activities by developing technology solutions, simulators and decision-support systems that ensure information superiority in the maritime environment. Within CASNAV's the Advanced Laboratory for Operational Research and Artificial Intelligence (LAB-APOIA) play a particularly relevant role, as will be discussed in chapter 6.3.

The Navy also operates SeCiber, which focuses on cyber defense to enhancing Naval power and ensuring the digital security of networks and onboard systems of ships and submarines. To this purpose, SeCiber must ensure the integrity and availability of naval weapon and control systems against adversarial cyber-attacks.

Finally, the Navy Research Institute (IPqM) conducts research and development of hardware and sensors, complementing CASNAV's work by creating national technology, increasing national sovereignty and reducing Brazil's dependence on foreign nations.

Like the Army, the Brazilian Navy has formal guidelines to make sure the use of AI is reliable and in full compliance with Brazil's ethical and legal requirements. This commitment is anchored in two key federal laws that govern transparency and access to information (Law No. 12,527/2011) and ensure the protection and privacy of personal data processed by AI systems (Law No. 13,709/2018). Based on this foundation, the Navy considers military ethics to be the primary guiding principle for the use of AI. This implies that AI development must be fully aligned with military codes of conduct, encompassing values such as duty, discipline, loyalty, courage and integrity.

5 Funding Defense AI

The Brazilian AI Plan (PBIA), which is part of the country's AI strategy, outlines the future roadmap to develop national AI capacities. With an allocated budget of BRL23bn (USD4.3bn) until 2028, approximately BRL1bn (USD180M) has been mobilized through FINEP and the National Bank for Economic and Social Development (BNDES). The objective is to finance projects with immediate impact, particularly those related to defense.

Under this plan significant investments were allocated to build the Santos Dumont supercomputer located at the National Laboratory for Scientific Computing (LNCC) and linked to the MCTI. This system is fundamental to support AI operations of the Brazilian Air Force and the Navy. The system was modernized in 2019 to advance its processing capacity to 5.1 petaflops (quadrillions of operations per second) and is one of the region's most powerful computers. The system is used for AI algorithm training, data analysis, and operational research.

Overall, Brazil is Latin America's biggest defense spender. In 2024, the country spent around BRL133bn (USD23.8bn) on defense. This, however, represents only 1.1% of its GDP and puts the country behind Colombia (3%), Guyana (2.4%), Chile (1.9%), Uruguay (1.8%) and Ecuador (1.5%).²⁵ Dedicated spending on defense AI is miniscule. The Air Force, for example, invested BRL6.5M (USD1.2M) in LabIA, while the Ministry of Defense allocated undisclosed sums to enable SISFRON (Army) and to integrate AI-enhanced predictive analysis into the Navy's Amazon Blue Management System.

In addition, the MCTI has opened a credit line that Brazilian defense companies can use to convert analogue into AI-based processes. In total, BRL120M (USD22.4M) were released under a specific grant to support technologies for more sustainable aviation.²⁶ This included, for example, applications in autonomous flight and flight safety systems, more efficient energy storage systems and initiatives that encourage the use of strategic fuels and minerals within the country, among others. In addition, the Brazilian Funding Authority for Studies and Projects (FINEP) has funded several AI projects:

²⁵ For more, see: SIPRI Yearbook 2025. Military spending based on <https://datos.bancomundial.org/indicador/MS.MIL.XPND.GD.ZS> (last accessed 18 February 2026).

²⁶ "Com a presença de Lula, são lançados 11 editais de Subvenção Econômica do Finep Mais Inovação, com valor total de R\$ 2,18 bilhões" (With Lula in attendance, 11 calls for proposals are launched for Finep Mais Inovação economic subsidies, with a total value of R\$ 2.18 billion).

- Kryptus was selected to develop cyber security and advanced cryptography systems. As part of developing this solution, Projeto Typhon has received funds to develop a cyber defense system using AI.²⁷
- The defense company IACIT received a total of BRL28M (USD5.4M) to develop software for autonomous systems like drones and flying cars.²⁸

In addition to specific projects, FINEP is also directly supporting companies. Sistemas Integrados de Alto Teor Tecnológico (SIATT) for example, which is developing missiles, has received funds to develop intelligent and autonomous systems.²⁹

27 "Kryptus es seleccionado para desarrollar el primer sistema de ciberseguridad inteligente autónomo brasileño" (Kryptus selected to develop Brazil's first autonomous intelligent cybersecurity system).

28 For more, see Finep assina contrato de financiamento com a IACIT para desenvolver sistema de "Finep assina contrato de financiamento com a IACIT para desenvolver sistema de controle de drones e carros voadores" (Finep signs financing agreement with IACIT to develop control system for drones and flying cars).

29 Moralez, "Un ejemplo para el continente" (An example for the continent).

6 Fielding and Operating Defense AI

Brazil's military services use AI to support enterprise tasks and mission tasks across a broad spectrum of functionalities. As the fielding of AI has only started very recently, it is difficult to assess its impact on the armed forces' effectiveness. At the same time Brazil's defense companies, which have been approached for the conduct of this study, are very reluctant to provide details about their adoption of AI. This makes it difficult to gauge Brazil's defense industrial readiness for AI.³⁰ It is, however, obvious that exposure to AI will increase as Brazil is about to procure modern defense equipment from partners that will be equipped with AI. To what extent this will enable Brazil's armed forces to benefit from other nations' experiences, remains to be seen.

In addition to service specific AI solutions one of the country's central applications lies in improving border security under the SISFRON program. The goal is to install sensors and monitoring centers along Brazil's entire border to deter illegal activities. The purpose of using AI is to provide improved solutions to identify criminals and their networks and to identify, track, and monitor suspicious behavior along smuggling routes.³¹

6.1 Army

One of the Army's earliest initiatives involved the use of bots for administrative functions, assisting military personnel with basic tasks. In 2019, the Brazilian Army implemented a basic module to respond to external public enquiries, clarifying questions, and disseminating information. Known as MAX, the Army uses AI in an enterprise application to respond to user integration on social media and messaging channels such as Messenger or Telegram.³²

The Army Cyber Defense Command (see chapter 4.3) employs AI algorithms to analyze traffic patterns across critical infrastructure, identifying anomalies that may indicate the onset of a cyber-attack. By processing thousands of security events per second, AI filters false and genuine alerts, enabling specialists to focus on real and complex threats. At present, AI also operates autonomously, using pre-established patterns to respond to attacks by blocking access ports or isolating network segments, thereby preventing an attack from progressing. In addition, AI

30 Given the fact that local defense AI development is underdeveloped right now, no initiatives or policies have been identified to regulate the export of AI software or tools that employ AI.

31 Zapparoli, "Border surveillance;" de Oliveira Alcenar/Contini, "The Pilot Project of the Integrated Border Monitoring System (SISFRON) and the Brazilian state action in the fight against drug trafficking in the State of Mato Grosso do Sul," Soares/Souza, "The use of Artificial Intelligence in SISFRON."

32 "Inteligência Artificial do Exército é promovida" (Promoting Army Artificial Intelligence).

is applied to test the robustness of new cryptographic protocols, seeking vulnerabilities that could be exploited by advanced computing capabilities in the future.³³

In addition, the Army also uses AI for wargaming to support the creation of dynamic scenarios for high-complexity training, simulating an adversary that learns and adapts its tactics during the exercise. There is also significant relevance in the domain of big data, with the processing of exercise results identifying systemic weaknesses in national defense and generating continuous improvement reports for the participating institutions.³⁴

6.2 Air Force

Brazil's Air Force is using AI for a broad spectrum of enterprise and mission-oriented tasks. To support enterprise tasks, the Air Force is using AI for operational and administrative support processes, facilitating analysis, orientation, and risk management. In addition to increasing agility, it improved efficiency in the use of human resources, allowing personnel to focus on core mission tasks.³⁵ In December 2025, the Air Force, like the Army, has launched FABIA, an AI-tool, to interact with Air Force personnel and provide rapid and accurate responses on matters of interest. The virtual assistant uses AI to understand questions, guide users and support the dissemination of official information, contributing to greater efficiency in service delivery and institutional transparency.³⁶

In support of Air Force missions, the Aerospace Operations Command, a high-level body responsible for operational deployments, disclosed in September 2024 using AI for air defense, search and rescue (SAR) and logistical transport.³⁷ In addition, the Air Force is using generative AI and machine learning for predictive analyses and simulations that make operations more agile and efficient, optimize mission planning and allocate air assets by selecting the best routes and maximizing the transport potential of available aircraft for personnel and cargo.³⁸ AI has also been employed in command-and-control, data processing and to identify patterns in intelligence, surveillance and reconnaissance (ISR) imagery.³⁹

33 Adapted from: Guerra Cibernética. Manual de Campanha (Cyber Warfare. Campaign Manual).

34 Based on: Diretriz Estratégica de Inteligência Artificial para o Exército Brasileiro (Strategic Artificial Intelligence Guideline for the Brazilian Army).

35 "FAB aposta em Inteligência Artificial para eficiência, segurança e inovação tecnológica" (FAB invests in Artificial Intelligence for efficiency, security, and technological innovation).

36 "FAB apresenta FabIA, sua nova agente digital com Inteligência Artificial" (FAB introduces FabIA, its new digital agent with Artificial Intelligence).

37 "Pesquisa desenvolvida no ITA utiliza Inteligência Artificial" (Research conducted at ITA uses Artificial Intelligence).

38 "COMAE, um precursor da Inteligência Artificial (IA) na FAB" (COMAE, a pioneer in Artificial Intelligence (AI) in the Brazilian Air Force).

39 Ibidem.

In the first half of 2025, the Air Force began using AI to detect aircraft wreckages thereby fielding a solution developed by the Graduate Program in Operational Applications (PPGAO) of the Aeronautics Institute of Technology (ITA), which has been adapted to Brazil's national biomes. The study used images captured by aircraft imaging sensors during real missions conducted by the 2nd/10th GAV Pelicano Squadron, a Brazilian Air Force unit specialized in SAR missions. The AI application is meant to accelerate aircraft search operations and close a gap. According to the Air Force, there is limited research focused on aircraft wreckage identification, despite the wide availability of software designed to search for and locate missing persons in forests or remote areas.⁴⁰

During the international Cyber Shield 2025 exercise held in the United States, the Brazilian Air Force (FAB) participated by testing AI-automated air defense systems designed to identify "drone swarms", as well as simulating real threats through cyber-attacks against FAB networks, including attempted intrusions into flight control systems, radars and satellite communications. During the exercise, AI tools developed at LabIA were integrated to detect intrusions within milliseconds, before human analysts could perceive the anomaly. In addition, the resilience of systems against drone "hijacking" and GPS signal interference was tested to prepare for the use of electronic warfare, which is increasingly common in modern conflicts.⁴¹

In the future, AI may also be incorporated into weapon systems acquired abroad. Saab's Gripen E, for example, which is currently tested by Sweden, has integrated AI tools for data processing and to control weapon systems. Similar applications of AI are expected as part of the Enhanced Modular Air Defense Solutions (EMADS) program, which is currently in the acquisition phase, with equipment selected from companies such as Leonardo, MBDA and other manufacturers.

6.3 Navy

The Brazilian Navy wants AI to contribute to executing complex tasks in an efficient manner to improve and accelerate decision-making.⁴² That's why the service is continuously monitoring the evolution of digital technologies⁴³ and has launched several AI use cases:

40 "Pesquisa desenvolvida no ITA utiliza Inteligência Artificial" (Research conducted at ITA uses Artificial Intelligence).

41 "FAB participa do Cyber Shield 2025 e reforça defesa cibernética" (FAB participates in Cyber Shield 2025 and strengthens cyber defense).

42 Brazilian Navy. Official response to the questionnaire submitted by the authors regarding the use of artificial intelligence within the Naval Force, 19 December 2025.

43 Ibidem.

- At the Naval Systems Analysis Centre (CASNAV), AI algorithms are developed to process data in support of decision-making; create highly complex and realistic training environments with adaptable and simulated enemy learning to increase exercise difficulty; and identify suspicious navigation patterns to support the monitoring of Brazil's coastline. CASNAV also oversees the Advanced Laboratory for Operational Research and Artificial Intelligence (LAB-APOIA). Although still an embryonic initiative, LAB-APOIA operates in modelling, simulation, optimization and decision support for naval systems, as well as in the development and employment of Unmanned Maritime Systems.⁴⁴
- Within SeCiber, a section dedicated to naval cyber defense, AI monitors the integrity of onboard software, detecting intrusions or malicious code that could interfere with missile launches or navigation. In addition, AI algorithms are employed in active defense to isolate critical systems when anomalies are detected within milliseconds, following the standards tested in exercises such as Cyber Shield. AI is present both in the systems of the Tamandaré-class frigates—within Atech's Athena Combat Management System, acting through machine learning—and in the Riachuelo-class submarines, within the Naval Group's SUBTICS system.⁴⁵
- In the field of electronic warfare, AI processes electronic signals, enabling systems to automatically identify the "signature" of enemy radars or sonars amid electromagnetic noise, assisting sensor operators much more rapidly in distinguishing friend from foe. Neural networks are also used to integrate data from different sources (optronic sensors, radars and sonars), providing operators with a single, clear picture of the combat environment.⁴⁶
- Moreover, several studies conducted by the organization have enabled the validation of computational solution concepts focused on autonomous operation and performance analysis in complex maritime environments.⁴⁷
- Finally, and to interact with broader public, the Navy has also been using AI for public relations. Particularly on Instagram, several campaigns have been conducted using films produced with AI tools that comment on ships and aircraft from the past or explain and highlight current combat systems in operation. All this institutional material has been prepared by private agencies contracted for this purpose.⁴⁸

44 "Lab=APOIA - Laboratório Avançado de Pesquisa Operacional e Inteligência Artificial" (Lab=APOIA – Advanced Laboratory for Operational Research and Artificial Intelligence).

45 Moralez, "La Armada de Brasil bota el submarino S42 Tonelero" (The Brazilian Navy launches the S42 Tonelero submarine).

46 For more, see <https://www.naval-group.com/en/systems> (last accessed on 18 February 2026).

47 "Lab=APOIA - Laboratório Avançado de Pesquisa Operacional e Inteligência Artificial" (Lab=APOIA – Advanced Laboratory for Operational Research and Artificial Intelligence).

48 For more, check the Instagram account <https://www.instagram.com/marinhaoficial/> (last accessed 18 February 2026).

Moreover, the Navy is engaged in procurement projects with international partners that will expose the service to new AI solutions. Both, the Navy's Prosub program to construct four Scorpène-class conventional submarines and one nuclear-powered submarine, and the Prosuper program to develop four Tamandaré-class frigates will include electronic systems that make extensive use of AI. How the Brazilian Navy will accommodate these foreign AI solutions remains to be seen.

7 Training for Defense AI

Brazil acknowledges the need to develop a qualified and trained workforce capable of working with AI and understanding it. However, to date no measures have been observed to significantly scale up the number of defense professionals with AI expertise, either through training programs within the Armed Forces or through the recruitment of civilian personnel, although courses and postgraduate programs focused on AI already exist.

The Navy, for example, has launched a course entitled “Introduction to AI Techniques” to advance basic qualifications through its personnel training plan.⁴⁹ In 2024, the Navy organized also the country’s inaugural “Course on AI Applied to Military Systems” in cooperation with the Getulio Vargas Foundation (GVF), Brazil’s oldest economic school.⁵⁰

The Army is also looking into how best to prepare its technical and operational personnel. Currently, it focuses on “training for the correct and ethical use of AI tools, especially those available to the general public.”⁵¹ Through distance learning and simulators, the Army has incorporated digital platforms to ensure that personnel in remote areas, such as the Amazon, have access to the same standard of technological training as units based in major urban centers. This training requires technical qualifications in information technology, data analysis and the operation of AI systems, ensuring that the use of technology on the battlefield is both effective and secure. In October 2025, the Army also signed a partnership with the Government of the State of Paraná to develop education-related research on AI, cyber security and quantum technologies.⁵²

The Air Force uses AI as part of a Ambiente de Simulação Aeroespacial (ASA-SimaaS), and advanced aerospace simulation environment that provides a “custom cloud-based simulation service for creating, configuring, and executing defense scenario simulations.”⁵³

In parallel, annual meetings among the Armed Forces’ Scientific, Technological and Innovation Institutions—such as the Army Technological Centre (CTEx)—promote the exchange of knowledge regarding the progress of education and research partnerships. Furthermore, the Higher War College (ESG) has also expanded its curriculum with an “Advanced Course in Cyber Security and Defense,” which, by 2025, already focuses on the use of cutting-edge technologies and autonomous systems.

49 Brazilian Navy. Official response to the questionnaire submitted by the authors regarding the use of artificial intelligence within the Naval Force, 19 December 2025.

50 “Realizada Aula Inaugural do primeiro Curso de Inteligência Artificial Aplicada a Sistemas Militares do País” (Inaugural Lecture Held for the First Course on Artificial Intelligence Applied to Military Systems in Brazil).

51 Brazilian Army. Official response to the questionnaire submitted by the authors regarding the use of artificial intelligence within the Army, 19 November 2025.

52 “Paraná firma parceria com Exército para desenvolvimento de pesquisas em IA e cibersegurança” (Paraná signs partnership with the Army to develop AI and cybersecurity).

53 Dantas et al., “ASA-SimaaS: Advancing Digital Transformation through Simulation Services in the Brazilian Air Force.”

8 Conclusion

At present, Brazil does not have a structured program for the development of AI in the defense sector, nor has it established clearly defined objectives to be achieved. Consequently, progress is not only limited in scope but is also driven by specific initiatives undertaken by individual services, organizations within them, or programs aimed at incorporating new weapons systems. Therefore, Brazil's defense AI approach is very fragmented.

Nevertheless, Brazil's Armed Forces are seeking to incorporate AI across a wide range of activities, ranging from citizen services to planning, enhanced situational awareness and cyber threat detection, as well as through the development of different personnel training programs and plans.

One of the main reasons for the country's slow and poorly structured development can be attributed to the chronic underfunding of defense during the past decades, compounded by the prioritization of certain major programs—such as F-X2 (fighter jet), Prosub (submarine development program), and Prosuper (navy vessel modernization program)—which consume a large share of the resources available for investment and capability acquisition. This makes it difficult to generate new programs capable of incorporating new capabilities more rapidly and on a larger scale, including the development and adoption of AI.

In addition, the absence of conventional conflicts in the region directly affects budget allocation and further delays the adoption of new technologies, as there is no perceived urgency driving such investments. Moreover, there is a clear lack of a strategic plan that includes the large-scale adoption of AI with defined objectives and measurable goals. Consequently, it is necessary to develop plans and directives governing the adoption and application of AI by the Navy and the Air Force, enabling more effective planning and the establishment of long-term strategies.

Several Brazilian companies possess the capacity to participate in the development and implementation of AI-based solutions. Significant defense industrial investments would thus make a significant contribution to defense AI in the country. This would support Brazil's objective of greater technological independence and open the possibility of becoming an exporter of software and systems that integrate AI as part of the solutions currently offered by Brazil's Defense Industrial Base. At present, there is an almost total dependence on foreign technology in this area, creating risks related to data leakage.

Finally, Brazil's legal framework has yet to mature, as there is currently no approved law regulating AI, although the enactment of Legislative Bill No. 2338 of 2023—intended to regulate the use of artificial intelligence—is expected soon. While this bill does not directly address the use of AI in defense, it establishes restrictions—such as those concerning the use of autonomous weapons—that directly affect the defense sector. Therefore, a major challenge lies in the need to develop an appropriate regulatory framework focused on the implementation of AI in defense, and to explicitly incorporate AI into the National Defense Strategy and the National Defense Policy. On 26 November 2025⁵⁴ both documents were updated. Although these documents mention innovation and technological developments, their references to AI remain superficial.

⁵⁴ "Política e Estratégia Nacional de Defesa e o LBDN são aprovados" (National Defense Policy and Strategy and the LBDN are approved).

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