The following article argues that Artificial Intelligence (AI) still holds much untapped potential and could constitute an essential part of future weapons systems in the next few years. AI is a technology of dual interest with an extremely wide range of applications. Defence and security are not the only sectors to be affected by the rapid development of AI, like the economy, law, institutions, health etc. For the moment, the use of this technology might not seem revolutionary, but it becomes clear that in terms of resources, humans are just as important as artificially intelligent technologies themselves. Computers are able to outperform humans when it comes to some tasks, however, the competence of the machine usually stops at the execution of those tasks. Finally, beyond the multitude of issues, questions of sovereignty and technological autonomy form a common thread regarding power and competition amongst states and private actors. Looking ahead, the EU AI strategy proposes powerful synergies between European partners that will ensure our present and future autonomy, and will play a key role.

France and Germany – Assessing a common praxis: towards the development, the use and the rise of artificial intelligence?

Dr. Océane Zubeldia

French Artificial Intelligence for tomorrow? Between ambition and efforts

According to the French Official Journal, Artificial Intelligence is the "theoretical and practical interdisciplinary field which aims to understand the mechanisms of cognition, reflection and to imitate them by means of hardware and software, for the purpose of assisting or replacing human activities"[1]. This technology combines perception, comprehension, and decision-making capacities, i.e. it artificially reproduces, as its name indicates the human thought process and even goes beyond. Its reproductive capacities arise due to two main reasons: the almost unlimited potential for automatic processing of a mass of data in a limited time, as well as a learning capacity, and the creation of applications that affect a multitude of sectors.

Thus, AI has become an essential tool in our daily lives and offers many services (voice recognition, weather application, robots for domestic use, GPS, et cetera), but these types of applications can also be repurposed for military use. AI is therefore a dual use technology; a source of rapid transformations and exchanges, as well as innovation. Being at the junction of sciences, technology, and humanity means that AI faces various issues and challenges, including those of operational, technological mastery, sovereignty, empowerment, ethics, and legal nature.

What role does Artificial Intelligence play in France? Since 20 January 2017, the French government has been committed to the development of this technology, which has materialised in the implementation of a national strategy. AI is a priority in terms of research, the economy, the modernisation of the public sector, regulation, and ethics.[2] In figures, the commitment to this strategy for the year 2021 meant the establishment of 81 AI laboratories in France, 502 specialised start-ups (an increase of 11 per cent compared to 2020), and 13,459 people working in start-ups[3]. Based on the 2019–2025 Military Programming Law, AI for military purposes receives an average of 100 million Euro of funding per year.

Artificial Intelligence is a priority for French technology policy. This is also why it is in urgent need of a more specific regulatory and ethical framework.

The French strategy: AI applied to defence

There is no doubt that France is committed to the development and strengthening of AI and that Germany is similarly interested in this technology.[4] With regard to their national strategies, both governments are focusing their efforts on how to use AI and how to develop related tools for the defence sector, such as weapon systems. Cooperation between the two partners is essential.

The implementation of policy guidelines

Following the *Villani Report* (2018), which outlined the basic goals and understanding of artificial intelligence,[5] and the parliamentary report of the National Assembly (2018),[6] France has continued to pursue policy efforts in the field of AI. The national AI strategy is divided into two timeframes: 1) 2018–2022, strengthening research capacities in order to give France the capability to position itself as one of the world leaders in related scientific disciplines and key information processing technologies; 2) 2021–2025, training and attracting the best AI talent with the aim of translating the research and development

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capabilities into economic success. In its political discourse, France clearly states that in order to be sovereign, it needs to master three key areas: the convergence of algorithms, data collection, and computing capacity. The "Artemis.IA" project (Architecture for Massive Multi-Source Information Processing and Exploitation and Artificial Intelligence, November 2017) piloted by the Defence Digital Agency for the Ministry of the Armed Forces is a perfect example for this. The project dedicated to data management has more than one string to its bow, in particular with the aim to create the ability to collect, store and cross-reference data from different sources securely, in real time. It is also designed to in turn provide the French Armed Forces with access to a sovereign storage "infostructure".

AI, a major tool at the heart of French military doctrine

In this context, it seems obvious that AI cannot be conceived without defence. Two main government decisions have cemented French interest in using AI for military purposes. The creation of the Defence Innovation Agency (AID, 1 September 2018), whose role is to federalise the innovation initiatives of the Ministry of Defence (coordination and coherence) and consistency to form partnerships with the civilian sector in order to benefit from its swiftness. Moreover, its role has expanded over time so that it is now a key point of contact for the Directorate General of Armaments (DGA); for example, it has invested in the development of a "methodological guide for the specification and qualification of systems integrating artificial intelligence" (18 January 2021). A second element, the report established under the name of "Task Force AI" (September 2019), points out the importance of appropriating the AI technologies in order to be able to ensure "operational superiority" of the French army.[7] To this end, it concluded that AI tools provide a decisive edge regarding comprehensive battlefield awareness and anticipation so that related decision-making can take place. Thus, it also improves the protection of personnel or equipment, and frees soldiers from routine tasks, which in turn limits the risk of errors or optimises flows and resources.[8]

From this perspective, AI is an integral part of any army of the future. In addition to improving decision-making, it can protect and increase

efficiency, for example in the case of high-risk tasks (mine clearance, evacuation of the wounded), and aid support functions (automatic and predictive maintenance, performance of repetitive mechanical tasks), as well as military training. As was evident in Ukraine, conflicts take place in the physical and virtual space: cyberspace has become a difficult area of conflict to control in recent years and related attacks have consequences in the physical world, not only for military equipment but also for society at large. This statement by Cédric Villani, author of the report on AI, underlined the fact that: "Artificial intelligence cannot be thought of in a solely national framework."[9]

The cooperation between Paris and Berlin seems to move towards this understanding of AI.

Successes and challenges of Franco-German cooperation

It is clear that the opportunities for the military use of AI are growing with technological progress and are de facto becoming more widespread. This development inevitably raises questions about the human-algorithm interface and the role that AI can play in the conduct of our operations both within our own forces and with our international and European partners, where Germany remains a key partner. Moreover, in the military field, notably with the Bundeswehr, various operational achievements have already been made (Franco-German brigade and joint air unit of C130-J transport aircraft, A400M, joint training, et cetera).

These areas of cooperation associated with AI will be topics of discussion in the future in multilateral projects and the export of Franco-German war material, for example the Future Combat Air System (FCAS), the strategic AI military equipment of the future. Three European partners Germany, Spain, and France initiated the project in 2017.[10] Since its inauguration, it has faced various disagreements, which revolved around the division of industrial responsibilities and the sovereignty of knowledge and intellectual property. In addition, the Russian invasion of Ukraine has accelerated military dialogue in Europe and highlighted the urgent need for a solid and credible military force that can ensure peace on the continent for the coming

decades. At the end of September, the meeting between the German Minister of Defense, Christine Lambrecht, and the French Minister of the Armed Forces, Sébastien Lecornu, helped move the discussions forward by emphasising that FCAS was a priority for both countries. The French minister also stressed that:

> "We need this innovation and we need to think about what the fighter aircraft of the future will be, and we must already think about the regeneration of our equipment in this area. This is true for the FCAS, and of course it is also true for the tank of the future"[11].

Beyond artificially intelligent technologies themselves, we must not forget the global perspective to AI development and usage.

Unlimited competition and the need to strengthen cooperation

The contribution of AI-related technologies to defence is of prime essential, but at the same time France will have to compete internationally with other countries that build industries around AI. This AI competition is not only:

> "[a] race for means, but a struggle of models – of organisation, of values and of collective preferences. It is these models that are already articulating the multiple facets of AI to make it a tool of power likely to structure the international order."[12]

From this perspective, the need to think of certain projects on a European and international scale is essential. A cooperative effort must be maintained and constantly nurtured.[13] Therefore, it needs to sustain a dynamic that will allow us to be a sufficiently powerful lever to meet the challenges of inherent international competition that exists regarding AI and also to reduce critical dependencies.

In this competition around AI norms and standards with countries that may have fewer concerns about ethical values, France is convinced of its ambition to develop AI in a responsible way,

The contribution of AI-related technologies to defence in France is indisputably essential, but simultaneously France will have to compete internationally with other countries that build industries around AI.

based on international law, multilateralism and strategic stability; in particular, its assumes choices which necessarily imply a human supervision.[14]

Numerous efforts have been undertaken and are still being undertaken in terms of AI standards, work that will make it possible to consolidate the French defence strategy, and to respect ethical concerns without closing the door to progress, innovation, and cooperation.

From regulated AI to an ethical framework

AI ambivalently confers both a range of possibilities and risks that countries in Europe aiming to maintain European values can frame by being norm-setters.

Starting from the fact that, at the moment, there is no real international regulatory framework, this should be a starting point. Artificial Intelligence has been a top priority for the Council of the European Union (EU) since the digital summit organised by the Estonian Presidency in September 2017, which, after a great deal of work, led to the "Ethics guidelines for Trustworthy AI" as part of the establishment of a European AI strategy in April 2019.[15] On 21 April 2021, the European Commission unveiled its first proposal for regulating the use of Artificial Intelligence as part of the development of trustworthy AI, a strategy that France has also recognised. To this end, French policy aims to integrate trusted and ethical AI into the civil sphere in line with the European digital strategy. Moreover, the National Commission for Information Technology and Liberties (CNIL), a public body whose mission is to protect personal data, including in the internet, has been entrusted by the France's State Council with the task of strengthening its powers by making it the national supervisory authority responsible for regulating AI systems under future European regulation.[16] Since AI is not only the prerogative of the civilian world, defence will also be at the heart of ongoing reflections.

France created the Defence Ethics Committee (COMEDEF, 2019) to address ethical issues originating from Artificial Intelligence and those related to scientific technological developments, such as new

weapons systems or other tools with a military function. To this end, the former French Defence Minister Florence Parly stressed that:

> "These are technologies that will take man out of his natural limits, whereas until now, these technologies have only helped him to push back those limits. It is about defining the place of man in the age of autonomous machines and machine learning. It is about conflicts that extend to new spaces, where the law suffers from many grey areas, where the absence of law will generate temptations and tensions."[17]

Armies have integrated this dimension and their commitments include three fundamental principles: international law, the permanence of a command responsibility, and the maintenance of sufficient human control. The challenges ahead are extremely wide-ranging and armies cannot be helpless in the face of the rising power of AI technologies. They will increasingly be embedded and require to be understood in terms of several concomitant technologies, including the collateral effect induced. A representative example is the use of batteries for automated robotics. The performance of unmanned systems – with AI – would be highly dependent on the ability to capture, process, transmit, and receive data.

Faced with the emergence of digital technology, armed forces have adopted a future model of engaging their units in a collaborative combat mode, a key factor in operational superiority. The question of human resources and capabilities remains essential to achieve this model.[18] Indeed, combatants are as important as the technologies and military equipment used. The latest work of the Defence Ethics Committee raised these imperatives in two recent reports (13 April 2022): one on the "digital environment of the combatant", the other on "ethics in military training". The government must maintain efforts to anticipate future questions around AI ethics, as artificially intelligent technologies are constantly evolving in this area(non-discrimination, respect for privacy, et cetera), and its robustness, or the quality of training data following the example of the guidelines given by the General Data Protection Regulation (GDPR)[19]. The principles set out are broad enough to be applicable to multiple cases and rigorous enough to respond to developments in training.

Advances in AI can also come from civil society, creating space for cooperation between the different actors. An example is the Aachen Treaty (2019), which aims to strengthen Franco-German cooperation in the field of AI. It prompted a joint call for projects in February 2021, received 25 projects of which five were selected and financed with 17.5 million Euro by the two partner countries.[20] This type of exchange or even the EU AI strategy are a driving force behind improved links amongst European partners, promote powerful synergies and will allow us to speak with a common voice in the future.

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2 It is based on three main principles, namely: developing an ecosystem of talent, disseminating AI and data in the economy and administration, promoting an ethical model that balances innovation, and the protection of fundamental rights. Read https://www.intelligence-artificielle.gouv.fr/fr/strategie-nationale/la-strategie-nationale-pour-l-ia, 14 June 2021.

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13 Ulrike Franke, "Artificial Intelligence diplomacy", Study requested by the AIDA committee, European Parliament, https://www.europarl.europa.eu, June 2021.

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