Sovereign AI and Strategic Decision Support

Jean-Baptiste Fantun

Abstract

Artificial intelligence has so far failed to accurately predict threats that could prevent security and defense disasters due to the way that AI is driven by Big Data, reducing AI to data-driven data. There is a need to improve human collaboration and expertise with AI knowledge in order to better anticipate security threats. The French start-up NukkAI is doing just that, creating a human-AI hybrid tool that can work with and understand human-designed machines, spotting patterns in real data and extracting human-understandable rules. This is an important next step in the function of AI in security-defense and intelligence work.

Keywords: Artificial intelligence, Big Data, shock anticipation, NukkAI

IA soberana y soporte a decisiones estratégicas

Resumen

Hasta ahora, la inteligencia artificial no ha logrado predecir con precisión las amenazas que podrían prevenir desastres de seguridad y defensa debido a la forma en que la IA está impulsada por Big Data, reduciendo la IA a datos basados en datos. Es necesario mejorar la colaboración humana y la experiencia con el conocimiento de la IA para anticipar mejor las amenazas a la seguridad. La nueva empresa francesa NukkAI está haciendo precisamente eso: crear una herramienta híbrida entre humanos e inteligencia artificial que puede trabajar con máquinas diseñadas por humanos y comprenderlas, detectando patrones en datos reales y extrayendo reglas comprensibles para los humanos. Este es un siguiente paso importante en la función de la IA en el trabajo de seguridad, defensa e inteligencia.

Palabras clave: Inteligencia artificial, Big Data, anticipación de shocks, NukkAI

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主权人工智能与战略决策支持

摘要

由于人工智能由大数据驱动，并将人工智能简化为数据驱动的数据，因此迄今为止，人工智能未能准确预测一系列威胁，后者可能导致安全和防御灾难。需要提高人类协作和对人工智能的专业知识，以便更好地预测安全威胁。法国初创公司NukkAI正致力于此，它创建了一种人机混合工具，后者能与人类设计的机器一起工作并理解这些机器，在真实数据中发现模式并提取能被人类理解的规则。这是人工智能在安全防御和情报工作中发挥作用的下一个重要步骤。

关键词：人工智能，大数据，冲击预测，NukkAI

In a world generating an exponentially increasing amount of data, we can expect Artificial Intelligence (AI) to help humans anticipate strategic shocks ever more effectively. However, from September 11, 2001, to October 7, 2023, despite the progress made by AI algorithms over these two decades, the machine has never been able to provide a single element to help predict these terrible events.

We will try to demonstrate here that the causes of these successive failures do not stem from a congenital inability of AI to provide anticipation tools, but from an overly exclusive focus on a certain type of algorithm. In contrast, NukkAI (a start-up we'll be talking about below) offers a new-generation AI that, in close collaboration with experts in the field, provides an innovative solution to the challenge of anticipation.

By way of preamble, let's define Artificial Intelligence as the ability of a machine to perform tasks usually reserved for humans, such as:

- *Learning*: a child discovers the world and, using examples (induction), learns to distinguish a cat from a dog, and so on.
- *Planning*: a couple prepares their vacation by taking into account their constraints (dates), their preferences, and so on.
- *Data fusion*: an investigator cross-references information from various sources to produce inferences.
- *Creation*: an artist imagines and produces a painting, a text, etc.

Let's face it, learning (the first example) from data (sometimes called *Big Data* if the volume of data is substantial) is just one AI paradigm (the best-known

method in this field is *Deep Learning*) among many. The problem is that in the last decade, all the spotlight has been on this specific type of data-driven AI, for both technical and political reasons.

Technical, because Deep Learning methods were the first to go to scale, benefiting from the immense progress made by micro-processors.

Political, because the GAFAMs, all American, have explained to the world that, outside *Big Data*, there's no salvation, for the simple reason that they own the data and have recruited the greatest experts in data-driven AI (Yann Le Cun, French Turing Award winner, heads *Meta*'s research). Concentrating both the data and the know-how in data-driven AI, they say to the rest of the world "stop doing AI research, you won't catch up with us, buy our products instead." And, in a fit of submission and ignorance, we swallow this rhetoric, reducing AI to data-driven AI.

However, when it comes to anticipation in the fields of security and geopolitics, nothing conclusive has ever come out of Big Data. Dumping all the data into a funnel and asking the machine, almost autonomously, to look for the needle in the haystack, has never worked so far. A few years ago we had *PredPol*, a pharaonic predictive policing project; the Los Angeles Police Department spent a fortune on it, only to come up with predictions equivalent to "there will be a cigarette hawk in the Barbès metro this afternoon"—a practice described by ironic field cops as "the prediction of banalities…"

We spoke earlier of October 7, 2023: Gaza is the area of the globe with the most data per m2, and it's certain that somewhere in the heap of data available to the Israeli security services existed all the elements which, put end to end, would have made it possible to anticipate the tragedy of October 7. What was lacking was the deductive intelligence to "*connect the dots*" and alert those responsible—nothing to do with *Deep Learning*. Thus, the project of machines that extract the substance of billions of data without the expert, to guide them and interact with them, is repeatedly showing its limits.

Faced with this hysteria around data-driven AI, a French startup, NukkAI, emerged in 2018, to make a dissonant voice heard, because the *Deep Learning* monopoly seemed to it to present dangers and limits: weak collaboration with humans, lack of transparency and data-hungry—and therefore an energy-hungry—character, unsustainable in the long term. NukkAI set out with the aim of creating a new-generation AI that collaborates with humans, is explicable and frugal with data. Its credo: "Just as humans possess several types of intelligence, machines must simultaneously mobilize several types of Artificial Intelligence." A hybrid AI, in short.

A classic approach in the world of AI, NukkAI chose a game to test its AI: Bridge. This game is both adversarial and collaborative, with incomplete information: its complexity made it the "last frontier of AI," the last game where humans

remained stronger than machines, since chess and Go had "fallen." However, in March 2022, NukkAI invited 8 Bridge champions[1] to Paris to compete against its AI "Nook" and ... Nook won all 8 matches.

Such a feat is due to the fact that Nook, unlike its chess or Go predecessors, uses several intelligences[2] including human expertise; this, to save precious resources: trained on Jean Zay, the CNRS supercomputer, Nook consumed 200,000 times fewer resources than AlphaGo, the Go robot developed by Google *DeepMind*! What's more, Nook knows how to explain its decisions, making it invaluable in the eyes of Bridge experts.

Back in the real world, Nook was quickly adapted to problems of great combinatory complexity, such as airline operations planning or to coordinate real-time replanning of boat fleets in the event of a climatic disaster.

Several airlines have entrusted NukkAI with the task of drawing up their aircraft rotation schedules and assigning flight crews to each rotation. This highly complex process,[3] which with conventional algorithms would require a fortnight's effort with no guarantee of optimality, is now carried out in just 10 minutes, and results in the machine proposing several scenarios from which operational staff can choose, as there are several parameters to optimize simultaneously: rotation density, staff satisfaction, etc. NukkAI's AI is revolutionizing the transport sector, its first field of application, and this is just the beginning, as applications are also possible in healthcare and finance.

In the Security-Defense field, NukkAI and Xavier Raufer were collaborating from 2019 on an exploratory project, *Braquo*, outlined in an article in *Sécurité Globale*.[4] Relying on green data or (media) and expert knowledge, the project presented valuable decision-support elements for planning the deployment of patrols on national territory.

Recently, NukkAI and Thales began working on a joint project[5] to merge heterogeneous data in the field of intelligence. This time, the expert knowledge of a NATO general guides the searches of the NukkAI algorithm, which, in a heap of green and closed data or searches for elements not always in the same language, or not designating similar objects by the same name. The AI then makes deductions and sends the analyst a recommendation to change the alert level, along with a

1 https://www.theguardian.com/technology/2022/mar/29/artificial-intelligence-beats-eight-world-champions-at-bridge.

2 https://www.lemonde.fr/blog/binaire/2022/06/28/nook-robot-de-bridge/

3 The number of possible rotations in a month for a 50-plane airline is 10 to the power of 1,350, compared with 10 to the power of 90, which represents ... the total number of atoms in the Universe!

4 *Sécurité Globale* N°27, Sept. 2021 Véronique Ventos and Jean-Baptiste Fantun « L'intelligence artificielle de confiance au service de la sécurité.

5 https://www.lemondeinformatique.fr/actualites/lire-l-ia-de-nukkai-epaule-le-war-game-de-l-otan-avec-thales-89193.html.

description of the elements justifying this recommendation.

Currently being tested in a NATO exercise, this tool will make command center analysts much more efficient. In the near future, it will incorporate a sovereign *Large Language Model* to support human-machine interactions, further enhancing the performance of the "augmented analyst."

This tool is an important first step, the first demonstrator of the potential of the human-IA pair in the intelligence field. In the future, it will be able to spot patterns in real or exercise data, extract human-understandable rules from them, and propose them to the analyst, to refine expert knowledge in a worm-loop system of human-machine interaction. At the conference held on November 30, 2023, at the Cnam, diverse high-quality speakers proposed geopolitical scenarios, drew maps of flows and corridors for the transport of goods, legal or otherwise, and so on. This con birth provides a framework that can help guide the machine, helping it to "focus on the essentials": we're at the opposite end of the spectrum from the conception of the autonomous machine.

Vladimir Putin has said "Whoever masters AI will dominate the world,"" and contrary to what some would have us believe, the race is far from over—even more so in strategic areas such as Security and Defense.

In addition, there are a number of players in France developing different types of AI that can provide solutions to the challenge of anticipation. These *start-ups*, major groups and experts are already working together to offer rapid, operational solutions to the problems encountered by players on the field. Their success will depend on the time factor, and on the ability of our public authorities to mobilize within timeframes that have nothing to do with the temporality of traditional defense programs.