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Policy Talk

Artificial Intelligence and EU security The false promise of digital sovereignty?

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This event has been organised by the
Technological Change and Society Interdisciplinary Research Cluster

Andrea Calderaro is a Senior Lecturer/Associate Professor in International Relations at Cardiff University and a Robert Schuman Centre for Advanced Studies Fellow at the European University Institute. **Calderaro**'s research centres on Technology and International Relations, with a focus on cybersecurity, cyber diplomacy, transnational governance of technology, digital transformations in the Global South, and the role of the EU in international cooperation in the cyber domain.

This event was inspired from a paper co-authored by Andrea Calderaro, "Artificial Intelligence and EU Security: The False Promise of Digital Sovereignty."¹ available here: <https://www.tandfonline.com/doi/full/10.1080/09662839.2022.2101885>. Thus, the first part of

¹ Calderaro, Andrea, and Stella Blumfelde. 2022. "Artificial Intelligence and EU Security: The False Promise of Digital Sovereignty." *European Security* 31(3): 415–34.

the presentation relied on this paper, while the second part focused on another research topic Andrea Calderaro is pursuing – the Global Race on Quantum Computers.

Calderaro began his talk by pointing out that he is an International Relations (hereinafter 'IR') scholar. Hence, he looks at technology – beyond AI – from an IR perspective. As such, he is interested in the impact of technologies on Global Order and the way in which actors, such as international organisations, interact with each other to promote technologies in a sustainable manner. Questions such as: what are the governance models that could be adopted, and what are the global challenges related to technologies rise. He believes AI is a relevant case study to figure out the Global Race on Advancing AI within the context of the current Global Order. Narrowing it down, what is the role/position of EU in this race. And more importantly, is the EU coping with these narratives of sovereignty of AI is precisely the question that the paper captured mostly. But to answer this, Calderaro chose a security perspective, otherwise specific to IR.

The presentation also covered the three main topics of the paper. First, Calderaro addressed an introduction in EU Strategic Autonomy and Digital Sovereignty. Second, he focused on the interrelations between interaction between AI and Security, and third, he looked further to what this implies for the EU Sovereignty's gain over AI. As mentioned above, lastly, Calderaro addressed another topic of his research – the Global Race on Quantum Computers, which he believes should take more space in the broader debate on AI.

To open the discussion, Calderaro provided a small background of:

- what is meant by EU strategic autonomy,
- how the EU is developing a narrative around EU strategic Autonomy, and
- what is the impact of technologies over this narrative, more precisely what is meant by Digital Sovereignty in the EU context.

He then introduced the intersection between the concept of Technology and International Relations. In doing so, he recalled Rosenberg's definition, which refers to the understanding of the means of production between a variety of actors, and more precisely between various parts of the world (such as, countries, regions). The reason why this definition was chosen is due to its relatedness to technology. The latter determines means of production and creates new equilibriums that very much explain our current global order, the historical framework, and usually this is useful to understand the economic perspective – how the accumulation of wealth and power takes place. Which Calderaro believes leads to a better understanding of the link between technology and IR.

The paper also looked at Immanuel Wallerstein's World System Theory, which captures the role of technology in explaining inequalities between countries and world regions. This means that in order to gain an advantageous position, one should hold a leading position in technology's development. Being a historian, Wallerstein argued how the fact that Europe, by developing several technologies and implementing the naval industry in the 15th century, gained a position of advantage vis-à-vis other parts of the world, in terms of imposing economic models and technological frameworks. Another example he offered was the UK's advantage following the creation of the steam engine.

In his paper, Calderaro applied Wallerstein's theory to better understand the current technology – the digital one –, which is creating new accumulation of power. By advancing technologies at a pace difficult to catch up, we can see the U.S. were able to impose the digital market and economical models. In terms of advancing technologies, we can easily observe the inequality between the U.S. and Europe. Calderaro also mentioned that his work focuses a lot on the Global South as well, where the inequality discrepancy is even bigger.

But how does the EU position itself in these narratives?

The EU is trying to build independence in a variety of sectors, beyond technologies. Calderaro stressed the novelty of the EU's Foreign Policy with the purpose to underline that by currently being 'in the making', it is clearly very much behind. This further led his research to a growing narrative around the notion of Strategic Autonomy and European Sovereignty, both aiming to create the EU's autonomy/independence from other actors.

And this is where technology comes in. It plays a crucial role in explaining forms of dependency from regions of the world or countries and fits this growing narrative of Strategic Autonomy and European Sovereignty. Calderaro highlighted that without gaining a leading position in the development of technology, the goals of Strategic Autonomy and European Sovereignty are not possible to be achieved. Given the above, Digital Sovereignty also became part of the EU's agenda. By Digital Sovereignty, one should understand the EU's gain of independency from non-EU digital intermediaries (for instance, Amazon, Google), but also independency from foreign technologies (among which, Huawei). Further, it leads to an even bigger claim: the EU becoming Global Leader in AI. But is the EU capable to gain such sovereignty, or even a Global Leader in AI?

One of the key takeaways of the presentation is the critique of approaching AI as such. Calderaro emphasized that AI is not a single technology, but rather a combination of technologies. In this sense, as framed in his article ("[Artificial Intelligence and EU Security: The False Promise of Digital Sovereignty](#)"). AI is made of hardware (or else known as computational capacity), data and algorithms. While one may argue that all these three components are always treated in the same way, Calderaro pointed out that this is not the case. The explanation is that most of the times different sectors/industries invest in hardware, data, and algorithms independently from each other. And while at times these three may operate together, other times they don't.

Further, discussing sovereignty over AI, one needs to discuss about all these three different sovereignties: over hardware, over data, and over algorithms. This means that becoming a Global Leader in AI would require becoming a Global Leader in each of these industries, hardware (including sovereignty over materials, such as microchips), algorithms, data altogether. This is why Calderaro raises awareness of the problematic of treating AI only as AI, without understanding its inner workings.

This means that in order to answer key question on whether the EU could claim its leadership in AI, we should first investigate if the EU leads any of these three AI-related critical sectors at all. The answer is not in many aspects. The U.S. is the leader when it comes to data and algorithms, whereas with regard to computational capacity/hardware, Calderaro pointed out that the discussion is a bit more complex. Given that the EU is not leading in any of these sectors, the only remaining option was to develop protectionist practices. When it comes to data, there is the GDPR – which aims to protect the EU citizens from the data-mining power of digital U.S. industry. Another example, with regard to algorithms, the emergency raised by the Cambridge Analytica Case stressed the algorithms' impact on the political environment, potentially capable of disrupting the democratic equilibrium of the EU. This led to the need of algorithms' regulation. Finally, there is also the protectionism over foreign hardware. What can be clearly observed so far is that the EU has been successful in implementing protectionist practices rather than being pro-active.

Next, Calderaro showed us a graphic comparing global investment strategies, as this is a metric to assess the EU's capacity to advance technology. We could observe that the EU's

claim to become a Global Leader is rather optimistic, North America and Asia are both far ahead. Another metric to assess the advancement of technology is the defence industry. Here as well, the EU lacks a defence agenda, in the sense that it is still far behind from other countries. And, unlike other countries, the EU lacks also the opportunity to rely on huge private and public investments.

However, in order to overcome the lack of global AI leadership, Calderaro argues that beyond the adoption of protectionist practices, the EU is also adopting diplomatic practices to gain centrality in ongoing negotiations over the growing AI global governance. Accordingly, the EU is successful in influencing the debate on AI regulation, especially in preventing the weaponization of AI. The reason is the general common agreement in principle of Member States on EU Values clustered around human rights. A common voice that is more difficult to achieve in the domain of security, a domain that is still fragmented across the EU.

II. The Global Race on Quantum Computers

Calderaro starts the second part of his talk by stressing that beyond the current debate on AI mostly approached in generic terms, the implementation of Quantum Computers is going to make a dramatic difference in terms of technological change, as it will create new forms of equilibrium in current Global Order.

As an introduction into Quantum Computers, Calderaro mentioned that when discussing with computer scientists, they say they have still little understanding of the potential implications of Quantum Computers as current development in the field is still a domain of Quantum Physics. While the functioning of traditional computers builds on Classical Mechanics, relying on what is observable, the quantum physics go on a subatomic level, which considers the endless number of conditions that could be represented. As a result of this, it is presumed that the amount of information that could be processed by adopting quantum physics are enormously more than what could be done with traditional physics. For instance, it is estimated that an amount of information currently processed by current supercomputers in 10,000 years would only take a quantum computer around 3 minutes. However, it is to be noted that there is no quantum supremacy yet, so this cannot be measured in reality.

Calderaro gave further practical examples. Taking the stock market, which relies a lot on the abilities and capacities of algorithms to process information, this means that whoever will adopt quantum computers, will be able to process information faster and potentially gain a huge position of advantage vis-à-vis other actors. Taking the pharmaceutical industry, it could lead to the capacity of developing drugs instantaneously.

Coming back to defence/security perspective, who will gain quantum supremacy, will be able to break passwords instantaneously, and thus access and gain control over any kind of system, including critical infrastructure. When it comes to cybersecurity, notably there are two parts involved: the attacker and the defender. What the attacker needs is to be as fast as possible to succeed, while the defender needs the computational capacity to identify the attack, track its source, and react. For these reasons, implementing quantum computers will be a game changer for defence capacities as well.

As we saw earlier, a metric for assessing the current state of the global race is to look at the global investments. When it comes to quantum computers. Calderaro pointed out his surprise to observe that the EU is not that far actually. Regardless of whether it is concerning or not, China is clearly dominating the race. But the EU comes in second. It is then followed by the U.S., UK, Japan, India, Russia, Canada, Israel, Singapore, Australia and then others. Narrowing further the focus on the EU's member States investing in quantum computers, we

can observe that Germany is the leader (with 47% of the total investments), being shortly followed by France (32%), then Netherlands (16%), Sweden (2%) and then others (within this latter category, the EU is also investing as a whole).

Recalling the previous definition of AI as a mix of three different components, Calderaro argues that the hardware is the more critical component. While it is still early to predict where this Global Race is heading, Calderaro thinks attention should be paid to this race rather than where the focus is currently: AI regulation.

Among the elements that fall into the notion of computational capacity, Calderaro recalled:

- connectivity and infrastructure,
- software and programming,
- investment,
- sustainability and resilience,
- local talent pool, and
- policy and governance.

He further mentioned that there is only one actor claiming to have gained quantum supremacy, and it is a private actor: Google. Evidently, it raises questions of the consequences of having a private actor potentially gaining supremacy over state actors. And this creates even further room for new directions of debate in IR.

Then, why is the EU building narratives of gaining sovereignty? From Calderaro's perspective, the EU is simply creating new forms of imaginary AI sovereignty. It is clearly far behind other actors, and it might never be able to achieve it. The reason Calderaro brings forth is the EU's failure to understand the inner workings of AI (hardware, data, and algorithms), which in turn cannot lead to AI's effective functioning. However, he also recalled the EU's success in diplomatic forums, especially on how to adopt these technological advancements.

Questions and answers:

With reference to Google's alleged quantum supremacy position, a Ph.D. Researcher asked what implications this could have for the EU. Calderaro answered that it is not whether Google has or not quantum supremacy that should concern us, but rather the novelty of the scenario that should: that is to have industry gain power over states. Of course, this is still a speculation and nothing more.

Observing the emphasis on production when discussing sovereignty, an EUI professor shared his perspective over markets and relations as a two-sided one, including both production and consumption. That is, if one wants to ex-post rationalize the EU's approach on regulation (= imposing in the international arena the EU's values), somehow is justified with the view that EU is a very large market of consumers, then it must follow the EU's rules. Thus, besides production, one should also look at the market in terms of consumption. He then asked whether this latter aspect would change the dynamics presented in the lecture.

Calderaro pointed out that the concept of sovereignty is a huge debate from a political science and IR perspective, and it is true that for some being able to protect the EU citizens is enough to tick the box. What he has been trying to do is to move the debate towards scepticism about the claim that the EU could become a Global Leader in AI. The problem he sees is that the EU treats interchangeably the idea of leadership in advancing technologies with leadership in digital sovereignty. His critique is that the EU is far behind from achieving global leadership

because of being behind in the tech industry in a variety of sectors. Scepticism could coexist with what could be or not achieved.

Another EUI professor asked a question from a legal perspective. The AI Act is the intervention of regulating producers and technologies to European level in order to enhance EU's position within the sector. But in that context, the reference to cyber security is very limited. The question was whether the EU wants to be participating in this field but does not pay sufficient attention when understanding tech. Calderaro did not seem surprised that AI and cybersecurity are still not linked to each other for some reasons, especially in the EU context. He believes the EU has been always at the forefront of addressing technologies with the aim of strengthening the market. But any time technology is associated with security, the debate is at a much lighter level. And this is precisely the problem, the lack of addressing these two together.

A Postdoctoral Researcher intervened and highlighted that among the reasons why countries impose restrictions on the transfer on data across borders, is also national security. And when that is the case, the restrictions are defined very broad. Because under the national security aim, one can justify almost anything. For instance, in Russia the restriction on data protection is set under an umbrella of national security as they require all data to be stored and processed within the country. Then in Africa, there's a rise of a number of countries imposing restrictions on data based on national security, and what they often do is to look at China as an example to follow. Even countries that tend to be leaders in the digital field (i.e., Rwanda), there are a lot of restrictions that require to use local data centres to process data, which creates a lot of cybersecurity issues for them as they must process everything locally. Further, on top of privacy as a justification, we also see a law enforcement issue connected to security. That is, some countries justify keeping the data locally due to law enforcement (for instance, for domestic courts to have easier access when requesting information related to a pending case).

A Ph.D. Researcher further asked how one could reconcile the potential emerging clashes between sovereignty as an object of study and sovereignty as a concept, and how to distinguish them when making inquiries. In Calderaro's view, the two really go together. The concept is open for discussion, so the framing of EU's sovereignty or concept of sovereignty in general is still ongoing. The EU is an unusual actor, that is why EU's sovereignty is different from discussing what Italian sovereignty could be like for example. What was rightfully said is that sovereignty is complex to approach in itself, but when it comes to the digital domain it becomes even more complex – due to talking about flow of data and infrastructure (transnational), the rooting of data which is determined by tech protocols. All of these make it even more difficult for a country/an actor to claim digital sovereignty because the data is stored in cloud services spread beyond national territories. And this is why Calderaro is rather sceptical that any country will be able to achieve sovereignty over the functioning of its segments of internet infrastructure.

Another Ph.D. Researcher addressed the topic the quantum supremacy, this time from the perspective of the EU being halfway compared to China in terms of investments. However, if we were to add other Council of Europe member States/observer states (i.e., UK, the U.S., Japan, Canada), there might be a more balanced situation. The question is whether such a collaboration is feasible or not. Calderaro emphasized the EU's diplomatic capacity to engage with other actors to influence the global agenda on certain technological developments, which is clearly happening, for instance in the context of cybersecurity, or in the context of preventing weaponization of AI. However, when it comes to Global South, Europe does not play an influential role. China is the one influencing the Global South, and this may in turn influence ongoing negotiations within the UN context as well. Hence, at a first glance, there might look like there is a positive view on how these European investments could be put together and

compete with China, but on the other hand looking from a more diplomatic perspective, it may raise certain concerns, although there's nothing sure of what China will do, that is maybe China will be even better than the EU. But when talking about power relations over a variety of countries, this scenario is very likely to happen.

Another EUI Professor referred back to the representation of AI as a mix of data, algorithms and hardware, with their implications on sovereignty and security. In this context, certainly data is important, hardware is a necessity, but algorithms are much less relevant than expected. The explanation is that algorithms go back to the 1980s, and what is new is the ability of leverage of these algorithms through these very powerful computers and on big data. So, algorithms are not so relevant, yet people working on the algorithms, to design and handle these algorithms is a different thing. Thus, the question was whether an investment in human capital on the side of the EU could be a way to catch up. Calderaro absolutely agreed and recalled the importance of hardware, which in his view includes also the knowhow, the people, the academic institutions.

An EUI Professor noted that when as an actor one does not have the technology, one becomes a rule maker, and this is the EU's case, mainly due to budget constraints. The EU itself does not have the capacity to act on both the hardware and the software, the EU private actors are not generating anything close to quantum supremacy or even quantum participation, the question remains: how much normative power can obtain from, let's assume the AI regulation works, let's imagine a world where a whole lot of data comes to Europe, we don't have the quantum/AI capacity in a competitive way vis-à-vis the big actors, but somehow we are able through a smart regulation to attract people who want to locate their data, and therefore maybe create a virtual spiral because that can help AI development in the longer run, but is this kind of normative force through data location, a source of power for the Union and in that sense, not a source of sovereignty in the protectionist sense, but a source of sovereignty in the projection sense at the end of the day. Calderaro pointed out that what he sees is that foreign countries that are not sovereign at all about the digital environments (i.e., Global South), they tend not to care so much about regulation, but rather about who will give them the infrastructure for free. 75% of internet users are not located in the U.S. and Europe, but in the Global South, so there's huge implications about the digital environment. First, there's China that is basically building the digital infrastructure for free (i.e., building cables, and giving Huawei technologies), and second, there are U.S. based digital intermediaries that are offering for free to store the digital identity of entire countries. So, what is left for the EU to offer? With the regulations, the EU would most certainly not succeed; the thing that could be successful is to offer an alternative technology, an alternative model, and this could be GAIA-X – a cloud service designed by the EU, proposed as an entirely new model. It is different from what others offer, and potentially this could attract other actors and to gain sovereignty over data in a different way vis-à-vis these other competitors. In sum, the way to have an impact is through technology. And this is where the EU should invest more and do more.