AI Standardization and Foreign Policy

How European Foreign Policy Makers Can Engage with Technical AI Standardization

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Executive Summary

Technical standard-setting in artificial intelligence (AI) has a direct impact on traditional foreign policy domains, such as the protection of human rights and democracy, or foreign economic and trade policy. While European foreign policy makers engage in the regulation of AI at the United Nations, the Organisation for Economic Co-operation and Development, or at the Global Partnership on AI, they are absent from the AI standardization ecosystem.

AI standards herald market access, interoperability, and connectivity of products and services of private sector companies. AI standardization may appear to be primarily technical, but it is also responsible for the protection of fundamental rights when ethical AI principles are translated into technical standards. But standard-setting also has concrete geopolitical and geoeconomic significance as states begin to pursue coordinated AI standardization strategies that reflect their political and economic objectives.

Therefore, European foreign policy makers need to engage with the AI standardization ecosystem. There are two possible forms for such an engagement: active participation and passive information gathering and analysis. Both options are highly dependent on foreign ministries' available resources and political constraints. Because technical standards can be used to lower or be misused to raise non-tariff trade barriers, standardization policies traditionally fall within the purview of ministries of the economy.

Active involvement requires direct participation of European foreign policy makers in standards working groups at national, regional, and international standards developing organizations. This in turn requires capacity building in AI technologies and improved technical skills of the diplomatic corps. If direct participation is not possible, European foreign policy makers should nevertheless closely monitor developments in technical AI standardization judged near term and of high impact on their governments' foreign policy agendas. Additionally, they can empower civil society actors to participate in technical AI standardization processes, especially in the realm of AI ethics, pertinent to the international protection of human rights.

To effectively engage in technical AI standardization, foreign policy makers need to understand the logics, ambivalences, and red lines of its actors. International standardization organizations cannot cover gaps in policy making that have been left by political institutions. Therefore, European foreign policy officers should be careful not to over-legalize or over-politicize technical standardization bodies.

AI standardization helps to shape the economic realities that have a direct effect on foreign policy. Technical standards are an important component of the international regulatory framework for AI. If technical AI standardization continues to be excluded from the foreign policy agenda, European foreign policy makers deny themselves the opportunity to help shape the global AI regulatory framework. Therefore, European foreign policy makers should make the best possible strategic use of the opportunities available to them in engaging with AI standardization, rather than being forced to react to this highly dynamic process.

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1. Introduction

Artificial intelligence (AI) is increasingly relevant for many software-defined products—from autonomous vehicles to smart manufacturing, modern telecommunication networks, or high-frequency trading, to name just a few. The mushrooming of national AI strategies has proven that governments understand the potential of this general-purpose technology and perceive it to be instrumental for their economic growth. Technology leadership in AI can alter the international balance of power.

European foreign policy makers are involved in regulating AI, but they are not engaging in technical AI standardization. However, agreements regarding AI standards are bleeding into traditional foreign policy domains, such as foreign economic and trade policy, arms and export control, cyber security, and the protection of human rights.

This connection between AI and protection of human rights has created the link for foreign policy practitioners to govern AI technologies at the international level. Since 2010, foreign policy makers have been negotiating restriction of AI-enabled lethal autonomous weapons systems in the United Nation's Convention on Certain Conventional Weapons. On June 15, 2020, the founding members of the Global Partnership on AI (GPAI or Gee-Pay) agreed to support the development and use of AI in accordance with human rights.[1] This international and multistakeholder initiative adheres to the Recommendation on AI of the Organisation for Economic Co-operation and Development (OECD).[2]

European foreign policy makers have been instrumental in the creation of the GPAI. This shows that they are involved in the regulation of AI and in the international debate on AI ethics, as well as AI principles. However, a domain that is predominantly home to private-sector actors, standardization specialists, and government economists has gone unnoticed by European foreign policy makers: technical AI standardization. Technical standardization is to the private sector what regulation is to the public sector—a means for governing the use of AI technologies.[3] AI standards pave the way for market access, interoperability, and connectivity of products and services of private-sector companies that operate within an economic niche.

Technical standardization—typically the domain of ministries of the economy
Identifying foreign policy responsibilities in AI policy is challenging due to existing department assignments. Because technical standards can be used to lower or be misused to raise non-tariff trade barriers, standardization policies traditionally fall within the competence of ministries of the economy. Thus, foreign ministries often take a back seat to economic ministries in shaping technology and digitization issues. For example, from an economic and industrial policy perspective, ways are being sought—with the help of the German Chinese Commission on Standardization

(DCKN)—to reduce technical trade barriers between the two countries, promote bilateral economic and technical cooperation, and coordinate activities in international standardization organizations.[4] Such far-reaching collaborations should be assisted by expert foreign policy practitioners.

AI standardization, which, at first glance, may appear to be mainly technical, is also responsible for protecting fundamental rights[5] where ethical AI principles are translated into technical standards. This can be seen in the European Union (EU) Commission's draft proposal for a regulation on artificial intelligence (the AI Act).[6] Article 40[7] of the draft proposal leaves the door wide open for AI standards. Once companies implement harmonized AI standards[8] in the design and development of their AI systems, the companies abide by the draft proposal's provisions for high-risk applications. AI systems are then "presumed to be in conformity with the requirements" for high-risk AI applications set out in chapter 2 of the draft proposal. However, standard-setting has also concrete geopolitical and geoeconomic significance.

Geopolitical and geoeconomic relevance of technical AI standards
Standard-setting also has concrete geopolitical and geoeconomic significance. This can be observed in China's export of technical standards during its Belt and Road Initiative (BRI), and in the increasing number of Chinese chairmanships, secretariats, and concrete standardization projects at Standards Developing Organizations (SDOs).[9] In the first example, China replaced consensus-based international standardization with a regional variant. The second example provides proof of the strategic reasoning of an economic power whose most valuable companies produce state-of-the-art information and telecommunications technologies. Chinese technology companies depend on technical standards to sell these technologies in global markets because they ensure the interoperability of the companies' products and services. To this end, Chinese technology companies use international standardization organizations.[10] However, so do U.S. and European companies. The critical difference is that for years now, U.S. multinational tech companies have been driving standardization in information and telecommunications technologies.[11]

An assessment of U.S. and Chinese geoeconomic activities illustrates the countries' intertwined foreign and economic policies, which cannot always be dealt with in a way that separates the jurisdiction of economic and foreign ministries. This requires that most EU member states come up with a policy approach that combines economic and foreign policy perspectives into a unified tech policy strategy. Understanding the geostrategic behavior and implications of U.S. and Chinese standardization activities requires a foreign policy perspective. Technical AI standardization is tied to political and ethical core values. Transitioning these values into AI technologies should be ensured by involving foreign policy ministries in AI standardization processes.

Navigating the classical venues of foreign policy is not enough for foreign policy makers to ensure international AI governance that is in accordance with liberal democracies' values. Norms and technical standards are an important component of the international regulatory framework for AI and thus, an important area of engagement for foreign policy practitioners. If technical AI standardization continues to be excluded from the foreign policy agenda, European foreign policy makers will deny themselves the opportunity to help shape the global AI regulatory framework. This could be detrimental to international institutions, such as global trade and the human rights regime. Therefore, European foreign policy makers need to engage with the AI standardization ecosystem. Only in this way do they have a chance to shape a policy field whose importance to their own interests is growing substantially.

2. Technical AI Standardization and Foreign Policy

> To get a bird's-eye view of the relevant international standardization organizations that focus on technical standardization in AI ethics, consider the precursor to this paper: *AI Governance through Political Fora and Standards Developing Organizations – Mapping the actors relevant to AI governance*.[12] The mapping assists foreign policy makers in navigating the complex web of actors that govern AI ethics through the development of policy and regulation, or technical AI standards. That paper can be read in conjunction with this paper.

AI has an impact on foreign policy. As a general-purpose technology, AI can be applied to numerous different use cases and environments. Whether AI is applied to discover cancerous tissue or match a face scan against a database of mugshots, the underlying neural networks are set up similarly, but they have been trained on vastly different data. Foreign policy makers do not have to concern themselves with the architectural particularities of neural networks, but they must understand and be able to contextualize the technology's outcomes: This could mean confronting leaders of authoritarian states that use AI to develop large-scale state surveillance capabilities resulting in human rights infringements or when pondering the question of how to navigate international relations with increasingly confident multinational tech companies that possess resources similar to those of states from exploiting technological innovations to their economic benefit.

Technical standardization is essential for the development of AI systems (aligned or unaligned with ethical principles), and their distribution on international markets. Standardization affects the technology's trajectories. Moreover, technical AI standardization is an indicator of current and future capabilities of AI systems. The standardization process itself is a marker for the AI industry's motivations, concerns, and agreements. Consensus among private-sector actors, which has slowly been accumulating during lengthy standardization processes, can be very instructive to regulators that consider AI governance.

2.1. AI Standardization Topics That Are Relevant for European Foreign Policy Makers

AI standardization helps to shape the economic realities that have a direct effect on foreign policy. Standardization is an important component of private-sector AI governance. Therefore, foreign policy makers need to become familiar with the AI standardization ecosystem—its processes, venues, and topics. In addition to acknowledging the complex web of venues where AI standardization occurs, foreign policy makers should become familiar with AI standardization topics that are linked to traditional foreign policy domains. Therefore, foreign policy makers need to be mindful of the geoeconomic and geopolitical effects of AI standardization that influence the protection of human rights and the global balance of power.

2.1.1. The Protection of Human Rights

Foreign ministries of liberal democracies pursue two central tasks: They uphold democratic institutions that protect social equality and representation around the world, and they promote a human and civil rights–based system of governance, commerce, and security.[13] These tasks reflect the values of the open societies the foreign ministries represent. However, these objectives are under pressure from the accelerating proliferation of AI technologies.

AI is instrumental in surveillance practices that can infringe on people's civil rights and liberties. These practices are not limited to authoritarian states: AI-enabled surveillance, recognition, and tracking technology are also utilized by liberal democracies' police, border control, and military forces. These systems can cause harm, in particular, where they are operated outside the specific context for which they were designed.[14]

While a foreign policy domain, the protection of human rights has been impacted significantly by the negotiation and translation of so-called ethical AI principles into technical AI standards. Although not exclusively, the process of shaping technical AI ethical standards occurs with strong participation by private companies. AI standardization shapes AI design, development, and deployment. In turn, engineering pitfalls during the life cycle of AI systems, that is, in which the explainability and transparency of model predictions are assured, have an impact on AI standardization where these issues are addressed with AI standards projects.[15]

Technical AI standardization as a tool for achieving a human and civil rights—based foreign policy agenda

Technical AI standards translate ethical principles into technological building blocks of AI systems. Standardization activities conducted by important organizations that develop international standards set the foundation for creating AI systems aligned with liberal democracies' human rights regimes.

Knowledge about the operational mechanisms of AI (ethics) standardization is important for anticipating the technical trajectory of AI development where the protection of human rights is concerned. Furthermore, such knowledge can help prevent international conflict over the proliferation of AI technologies deemed to be dangerous to people's fundamental rights and freedoms, for example, systems whose operations do not comply with published AI ethical standards. This, in turn, can reinforce the human rights–based international order.

2.1.2. The Balance of Power

AI's core industrial inputs and their strategic value for governments

States have begun to perceive AI as a strategic economic asset that can achieve political strength. Leveraging this economic asset requires states to control key industrial inputs[16] that make up AI systems. Some of the key components include academic research institutes that push the frontier of AI research, a large AI talent base, an innovation ecosystem that connects academic research to the private sector, high quantity, quality, and diversity of data, big compute provided through hyperscale cloud infrastructures, large-scale public and private research and development (R&D) spending, and venture capital. If states want to achieve a technological edge in AI, they need to strengthen these domestic industrial inputs relative to their competitors.

Controlling these industrial inputs is very difficult: World-class academic research, for instance, is not possible without the free global movement of AI talent. However, the United States (US) has positioned itself well enough that its political and economic allies and rivals seem to depend on the US at least for the most vital AI industrial inputs: compute and algorithms. For example, U.S. companies design the most advanced semiconductors for AI acceleration,[17] and U.S. hyperscale cloud providers, such as Google, Amazon, Microsoft, and IBM, offer compute as a service.

AI also has a strong impact on the global balance of power. Many nations perceive this as a threat to sovereignty. This observation has led European foreign policy makers to contemplate the concept of *open strategic autonomy*. Although it is not yet clear how the EC wants to define this concept,[18] much less what a concrete policy might look like, the EU has begun to question its future economic and political

competitiveness, and sovereignty. Today, Europe's major leading industries, such as automobiles, machinery, and equipment, are at risk of being increasingly dependent upon an AI ecosystem controlled, defined, and advanced by foreign technology providers.

Governments' geopolitical and geoeconomic reasoning is transitioning into national AI standardization strategies

For Europe vis-à-vis the US, the issue is strengthening Europe's interdependencies and managing its dependencies where they risk being detrimental to European economic competitiveness. At the same time, the US is normalizing its trade relations with the European Union and is doing everything in its power to maintain its technological leadership over China. U.S. actions include listing Chinese AI companies Sensetime and iFlytek on the Bureau of Industry and Security's Entity List.[19] Companies listed on the Entity List are "subject to specific license requirements for the export, reexport and/or transfer (in-country) of specified items."[20]

It is not possible to achieve foreign policy objectives in AI without being at the forefront of AI technological development. Assuring foreign policy goals such as the protection of human rights requires leadership in AI technologies. This is also achieved through technical AI standards that are bound to core ethical and political values. To achieve this goal, states are pursuing coordinated AI standardization strategies. China,[21] the US,[22] Japan,[23] the United Kingdom,[24] Germany,[25] Australia,[26] and the European Union[27] have published AI standardization strategies. A comparison of four select national AI standardization strategies (the US, China, the EU, and Germany) can be found in the annex.

Although technical standardization is predominantly driven by private companies, bottom up, and consensus based, states have increased measures to assist national industries in using technical AI standardization to their benefit. Therefore, technical AI standardization is subject to governments' growing political influence. Thus, as technical AI standardization affects the global balance of power, it will cause geopolitical and geoeconomic ripple effects.

Currently, there is major political activity in technical AI standardization at all policy levels—nationally, regionally (i.e., European), and internationally. This activity is driven by the desire of states to achieve economic competitiveness and to strengthen technological sovereignty, which has considerable consequences for the balance of power. Not only is a comprehensive European tech strategy still missing, but also the European AI standardization strategy lacks a foreign policy dimension.[28] In contrast, the US[29] and China[30] present ample evidence of coordinated, whole-government approaches to tech policy. Consequently, the U.S. and Chinese AI standardization strategies are instrumental in achieving the national security, defense, economic, as well as foreign policy goals stated in the countries' broader tech policy strategies.

European foreign policy makers can assert themselves in AI standardization
European foreign policy makers have a strategic asset. Diplomats excel in persistent negotiation as well as conflict mitigation. Standardization is about overcoming conflicts of interest and reaching agreements that are beneficial to most market actors. This is essential for standardization. States are pursuing economic and political goals through AI standardization strategies. What is largely missing in these strategies are explicit foreign policy perspectives. A foreign policy perspective could help to balance conflicting interests between states regarding AI standardization. Thus, foreign policy makers should be assertive and pursue a seat at the table of technical AI standardization, because they can add tremendous value to consultations on international AI standards with like-minded partners as well as with political and economic rivals.

Foreign policy perspectives can help to balance economic interests in achieving market access and economic growth through AI standards with democratic values and the protection of human rights—principles that have often had second-order priority in international trade relations.[31] As previously described, foreign policy makers need to focus on topics in AI standardization that intersect strongly with traditional foreign policy domains. However, to navigate the ecosystem of technical AI standardization, it is necessary to be familiar with the relevant fora in which AI standards are created.

2.2. AI Standardization Organizations That Are Relevant for European Foreign Policy Makers

Technical AI standardization can occur at three levels: international, regional, and state. Although these levels seem distinct and separate, in standardization they are not; instead, they are interconnected. European foreign policy makers must engage at all three levels.

Standards developing organizations and special interest groups
The standardization process itself can be organized through standards developing organizations (SDOs), or it can be facilitated through special interest groups (SIGs) on an ad-hoc basis, depending on the shared interest of the participants in a specific aspect of a technology. Standard-setting through SIGs is common in specific technology areas of computer science, as well as for information and communications technologies (ICT) standards.[32] Standards facilitated through SIGs have significant buy-in from private companies and academic researchers; however, SIG standards lack the overall organization and facilitation of SDOs.

AI standards published through international SDOs, such as the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC), including their JTC1/SC42 joint activity, or the International Telecommunication Union (ITU), have global reach, because they include most countries as members. SDOs begin to work on concrete standards projects once the organizations' members have expressed that they need to. Technical standards published by SDOs supersede any competing national standards. All member states adopt these standards as all are represented by their national standardization committees (NCs) in these fora.

European standards developing organizations

Three European standards developing organizations (ESOs) are working on technical AI standards: the European Committee for Standardization (CEN), the European Committee for Electrotechnical Standardization (CENELEC), and the European Telecommunications Standards Institute (ETSI).[33] Whereas CEN[34] and CENELEC[35] comprise the NCs of every European member state, ETSI has a larger group of international members, among which are private companies and research entities from outside the European Union.[36]

National standardization committees

Last, NCs also work on technical AI standards. Depending on the NCs' respective membership structure, their members range from the private sector, the public sector, and academia to civil society organizations.[37] NCs engage in national standardization as well as in international standardization. They participate in standardization projects at SDOs and ESOs through so-called "mirror committees." This process now forms the majority of most NCs' work. NCs send subject matter experts from their member organizations to participate in the working groups at SDOs. NCs also send delegates to SDOs to vote on standards projects. At SDOs such as ISO, IEC, ITO but also at CEN, and CENELEC, each member country has one vote, although preparatory work often happens in "expert mode" where the role of SDOs is less important than the standing of individual experts.[38]

SDOs, ESOs, and NCs operate through steering committees and working groups. Once SDOs (at whichever level) have received input from members, the SDOs form committees that organize standardization workflows. The committees steer the process from the inception of a standards project to the adoption of a standard. The practical work on AI standards projects happens within different working groups.

2.2.1. Technical AI Standards Rooted in Principles of AI Ethics

Technical AI ethical standards at standards developing organizations
Technical AI standards reflect and incorporate ethical principles. They can ensure that AI systems operate in accordance with values associated with the collective term of AI ethics. This is best illustrated by the motto of the Institute of Electrical and Electronics Engineers' (IEEE) Global Initiative on Ethics of Autonomous and Intelligent Systems: "From Principles to Practice with standards projects (…) to inspire the Ethically Aligned Design of autonomous and intelligent technologies."[39] This two-pronged approach, *from AI principles to AI standards*, described in the motto, has been the IEEE Standards Association's (IEEE SA) modus operandi. First, the IEEE SA published two consecutive publications explored the principles of AI ethics. This effort established the foundation for the current P7000 series in which IEEE SA members negotiate AI ethical standards.

Important ongoing standards projects include the following, among others:
• Ethical Concerns During System Design (P7000)
• Standards for Transparency of Autonomous Systems (P7001)
• Standard for Data Privacy Process (P7003)
• Standard for Algorithmic Bias Considerations (P7003)
• Standard for Fail-Safe Design of Autonomous and Semi-Autonomous Systems (P7009)
• Standard 7010-2020 Assessing the Impact of Autonomous and Intelligent Systems on Human Well-Being – technically a recommended practice (published in 2020).[40]

AI ethical standards are also central to the collaboration between the ISO and the IEC in JTC-1, SC-42 "Artificial Intelligence". Working Group 3 "Trustworthiness" explores, among others, the following standards projects:
• Bias in AI systems and AI-aided decision making (ISO/IEC TR 24027)
• Assessment of the robustness of neural networks (Overview, ISO/IEC TR 24029-1; Formal methods methodology, ISO/IEC AWI 24029-2)
• Functional safety and AI systems (ISO/IEC AWI TR 5469)
• Risk management (ISO/IEC 23894)
• Overview of ethical and societal concerns (ISO/IEC 24368).[41]

However, the IEC is also pursuing AI ethical standards in the IEC's Standardization Evaluation Group 10 (SEG 10) consisting of two working groups:
• Autonomous and AI Applications Societal and Ethical Foundations (WG 1)
• Autonomous and AI Applications Specific Ethical Requirements (WG 2).

WG 1 seeks to develop a framework, process, or approach for applying ethics in different contexts and domains for standardization work.[42] WG 2 identifies and prioritizes specific ethical requirements of the IEC's technical activities related to autonomous and AI applications.[43]

Technical AI ethical standards at European standards developing organizations
The three ESOs, CEN, CENELEC, and ETSI, received input from the European Commission (EC) on ongoing standardization work in SC 42 "Artificial Intelligence", as the EC is a liaison to ISO/IEC JTC 1/SC 42.[44] CEN and CENELEC published their Focus Group Report *Road Map on Artificial Intelligence*, which provides a framework for European AI standardization. The Focus Group identified seven themes that will be addressed for European standardization, among which five can be described as a large part of the larger AI ethics debate on the protection of human rights: accountability, quality, security and privacy, ethics, and safety of AI systems.[45]

CEN and CENELEC recently created Joint Technical Committee 21 (JTC 21) on a standardization structure for AI, soon to be launched officially. Although the EC's draft proposal for AI regulation leverages harmonized AI standards, concrete AI standards projects at CEN and CENELEC are starting. ETSI is focusing on standards other than AI ethics, for instance, standards on security concerns of future networks.[46]

Although ESOs' work on AI ethical standards is only just beginning, and standardization processes at SDOs generally take time, documents accompanying the EC's draft proposal for AI regulation suggest that European AI standards should be ready by the time the proposal becomes applicable.[47] This could be years. However, it creates enough time for European foreign policy makers to acquaint themselves with European AI standardization processes.

3. How European Foreign Policy Makers Can Get Involved in Technical AI Standardization

AI standardization affects traditional foreign policy domains. Therefore, European foreign policy makers should engage with AI standardization, as well as the AI standardization ecosystem. However, they will face many political and practical constraints that will render involving themselves in this field difficult. Nonetheless, these challenges can be resolved. Active participation by foreign policy practitioners in AI standardization is necessary because tech policy issues require the involvement of political specialists from various departments, if not a whole-government approach. If foreign policy practitioners are not involved in the negotiation and conflict resolution associated with geopolitical and geoeconomic matters, such as AI standardization, the government will lose its ability to effectively resolve tech policy issues.

Before policy advice can be provided to foreign policy makers on how to bring their strength to policy matters related to AI standardization, the main reasons for the absence to date of European foreign policy makers from AI standardization must be introduced. Then active and passive strategies for engagement with the AI standardization ecosystem are explored. Important resources for European foreign policy makers' engagement are listed. Finally, limits for engagement that European foreign policy makers must know are explained.

3.1. Why European Foreign Policy Makers Have Not Been Engaged in Technical Standardization

European foreign policy makers participate in political institutions that advance the global AI governance debate, for instance, in AI ethics at the GPAI, OECD, G20, and similar venues.[48] However, policy makers do not participate in SDOs. At SDOs, private companies are in the driver's seat, and they reach voluntary agreements on AI industry standards, across the entire life cycle of AI systems, that have an impact on the AI policy framework. As shown, AI standardization has a clear impact on traditional foreign policy domains, such as economic and trade policy, democracy and ethics, and the protection of human rights. This requires foreign policy makers to become active. However, engaging in AI standardization is not a trivial endeavor.

AI standardization is not a classical foreign policy dimension where foreign policy practitioners, although generalists, would feel at ease. Additionally, AI standardization venues are highly technical. They involve the participation of private-sector specialists, academics, and other actors, who jointly advance technological devel-

opment within a specific domain of the larger AI standardization debate—be it in hardware standards, data standards, or AI ethical standards. Building understanding of AI requires some form of conceptual knowledge about the technology, its associated industrial inputs, and its intersection with policy considerations.

Traditionally, standardization, including AI standardization, has not been part of the European foreign policy agenda. Standardization belongs to the portfolio of ministries of the economy. However, in tech policy issues, dividing traditional department responsibilities between ministries of the economy and foreign ministries no longer seems reasonable, because tech policy themes, such as AI standardization, cut across both departments' responsibilities. This interdependency requires either increased coordination and cooperation between the affected departments or reorganization of the government. Current department responsibilities hinder European foreign policy makers from engaging more with AI standardization.

European foreign policy practitioners as stakeholders in the standardization ecosystem
European foreign policy practitioners could be involved in standardization work at NCs, if the practitioners chose to be. At NCs, public-sector representatives are allowed to join standardization working groups. However, NCs generally find it difficult to have civil servants participate in these groups. Often because standardization is thought to be highly technical. Therefore, in AI standardization, if NCs attract civil servants, they most likely come from ministries of the economy. Moreover, standardization mostly caters to the interests of private-sector actors. Therefore, tech standardization and AI standardization are overwhelmingly pursued by standardization specialists from private companies. Because of the technicality of the matter, academics are often passionately involved, too. Another important group is facilitators—standardization specialists employed at SDOs' that speak the language and broker deals (briefly, people instrumental in the overall standardization process). Because AI standardization focuses strongly on AI ethics, civil society actors and advocacy groups are also involved, but in a diminishingly small share.

3.2. Strategies for Engagement with Technical AI Standardization

European foreign policy makers are left with two options for engaging with the AI standardization ecosystem: active participation and passive information gathering and analysis. Both options are highly dependent on the available resources. In most European foreign ministries, tech foreign policy issues are not among the high-priority issues, although they have geopolitical and geoeconomic effects that influence the global balance of power. Thus, realistically, funding for AI standardization is limited. Therefore, in the short term, European foreign policy makers must set realis-

tic goals for their participation in AI standards-setting and prioritize their activity according to distinct foreign policy objectives (i.e., focus on standards-setting in AI ethics to protect the international human rights regime). In the mid- and long-term, more government resources should be allocated to foreign ministries' capacity to cover technical AI standardization extensively (enlarge the scope of topics to cyber security and standards-setting relevant to foreign economic and trade policies). Participation requires constant negotiation, learning, and maneuvering between strong (geo)political and (geo)economic interests, skills in which European foreign policy makers are highly trained. This asset must be carefully allocated to a problem in AI standardization deemed to be short-term and have a high impact on their foreign policy agendas.

3.2.1. Strategies for Passive Engagement

Reporting on standards developing organizations' activities surrounding AI technologies
Foreign ministries can help shine a light on technical AI standardization by developing a system that systematically gathers information and analyzes developments in AI standardization that intersect strongly with foreign policy, for instance, by collecting and assessing evidence of how states and economic regions position themselves in technical AI standardization. To prioritize this effort, effects that are assessed as short-term and have a high impact on foreign policy could be emphasized.

Reporting is an essential function of foreign ministries. This can be leveraged through the international embassy system, a network of aggregated information gathering and sharing. Given limited resources, the challenge is to select the most relevant SDOs or to monitor their most influential actors. This should start by establishing work relations with NCs that are best informed on what other countries and international private actors deem relevant in international AI standardization. This effort can also be complemented by direct engagement with private companies. Leveraging information on what they perceive as problematic, given geopolitical and geoeconomic tensions that emerge from discussion among participants during the meetings of working groups at SDOs or ESOs, can further help to inform a European government about the geopolitical effects of AI standardization.

Until now, information on what happens in international and European standardization organizations has been dominated by industrial policy perspectives. Foreign ministries may have the opportunity to leverage this essential function and monitor this space in a way that is relevant to foreign policy concerns. The ministries could collect the information themselves (which requires active involvement in the working groups that, in turn, requires significant investments in foreign policy staff

capable of participating in long-term standardization activities) or commission market observers to collect it. The latter is valuable when additional technical insight is required to evaluate the reporting subject. Then, foreign policy assessments can be made based on these conclusions.

Supporting civil society actors in their work at standards developing organizations
European foreign ministries can enable actors from civil society to participate in the substantive work of shaping norms and technical standards that, for example, protect fundamental rights. The working meetings of standardization bodies take place throughout the year and around the world. Participation is a costly endeavor, favoring large private-sector companies. Because technical standardization is in the strategic interest of corporate policy, considerable money is spent on regular participation in such international bodies.[49] Representatives from science or civil society try to prevent possible negative effects of these technologies on societies, and their active participation in technical standardization is a prerequisite.

European foreign ministries could financially support the participation of non-government organizations (NGOs) and advocacy organizations in standardization bodies so that the organizations can be involved in the substantive work of various working groups throughout the entire process of shaping technical AI standards. Grant-making is the appropriate tool for European foreign policy makers to empower civil society actors to actively participate in technical AI standardization where it strongly intersects with the human rights agendas of European foreign ministries.

3.2.2. Strategies for Active Engagement

Start by approaching national standardization committees
European foreign policy practitioners need to find the standardization organizations relevant to their designated subject matter and objectives. When deciding which SDOs or ESOs to engage with, European foreign policy makers can rely on the expertise offered by NCs. NCs are aware of all ongoing international standardization activities. Moreover, SDOs do not come up with standardization projects without having been requested by NCs. Thus, the way into international and regional standardization organizations is through NCs. Notably, they mirror standardization activities at SDOs and ESOs to help their members better coordinate these standardization projects. Thus, establishing a relationship with NCs is the necessary first step.

Add a foreign policy perspective to national AI standardization strategies
National standardization strategies cater to their private industries. However, standardization carries values beyond questions of interoperability or connectivity. This becomes obvious in the case of AI ethical standards, such as fairness or account-

ability. Technical AI standards reflect the values of political systems.[50] The standards can reflect liberal democracies' values, values rooted in human rights, but standards can also adhere to principles that liberal democracies would oppose.[51] By engaging with the AI standardization ecosystem, and by guiding the standardization processes toward a principle-based rationale, European foreign policy makers can bring the foreign policy perspective to national standardization strategies. This is an important corrective for standardization strategies that focus only on the economic aspects of technical AI standardization.[52]

Increase cooperation and collaboration with other government agencies
Tech issues cut across many government departments' responsibilities. This is especially true for AI. This is rooted in AI's industrial inputs that themselves cut across the responsibilities of a handful of different government agencies. Foreign ministries protect the international rights-based order by exercising export control on technologies deemed of dual use (technologies than can be used for both civilian and military purposes[53]). Export restrictions have clear national security and human rights dimensions. In this area, there is a long history of successful cooperation among foreign policy, trade, and economic policy. Foreign ministries and ministries of the economy often collaborate well. The same logic should apply for jointly determining which technical AI standards pose dangers to the protection of human rights. This requires European foreign ministries to coordinate their activities with other government agencies. It can also be appropriate to articulate red flags, especially where considerations of human rights protection require that economic motivations must be restrained. This requires constant negotiation and mitigation, and the integration of foreign policy insights into government processes, which European foreign policy practitioners need to play to their advantage.

Increase international cooperation and collaboration on joint standardization activities
If states pursue national standardization strategies, these strategies must include a foreign policy perspective. The foreign policy perspective should address international cooperation with allies and like-minded partners on matters of technical AI standardization. Brokering agreements between different countries matches the talent of foreign policy practitioners. However, this activity should be informed by the understanding that technical standardization must remain an industry-driven, consensus-based, and bottom-up process. Private corporations often emphasize that agreements between states on joint standardization activities cannot interfere with this logic. Nevertheless, collaboration between states on AI regulation, legal frameworks within which standardization will later operate, can orient private-sector actors and inform their work on technical AI standards.

3.3. Resources Needed for Engagement

Engaging in technical AI standardization, actively or passively, requires certain resources that foreign ministries must provide to their staff if they want to help shape private-sector AI governance in technical AI standardization. In addition to financial resources, adequate staffing and capacity-building and technical skills of their diplomatic corps are required, as well as a rethinking of the key strategic priority areas of contemporary foreign policy.

Make tech policy a priority issue area of 21st-century foreign policy
Traditional foreign policy areas have changed considerably due to the increased relevance of emerging and foundational technologies, such as AI and semiconductors. This change requires European foreign ministries to divert resources to assess technological developments and the impact on human rights, trade policy, and the global balance of power. This involves a rethinking of the traditional set-up of European foreign ministries. European foreign ministries need to become more open to staffing industry specialists in roles normally reserved for the diplomatic corps. The academies must emphasize education more strongly in tech policy issues, and their potential impact on international relations. However, most importantly, more money must be spent to introduce tech policy issues into the responsibilities of foreign ministries. High-ranking diplomats in charge of tech policy issues need robust ownership of matters of tech policy, and effective degrees of freedom to shape the ministry's tech policy agenda and to coordinate tech policy issues with other government ministries and agencies. The current lack of ownership and accountability impedes European foreign ministries from exercising a stronger role in international tech policy.

Develop expertise in AI technologies and their impact on foreign policy
To be able to assess the significance of information technologies for the policy interests of European foreign ministries, they must enable foreign policy officers who are involved in digitization topics and technology policy to develop technical expertise. Emerging technologies such as AI can be best understood and assessed based on their technological resources. Key industrial inputs are specific AI semiconductors (hardware), AI-related software environments (software and algorithms), data, skilled labor, and capital.[54] Based on the individual components, conclusions can be drawn about the composition of international value chains, interdependencies (global talent flows of AI researchers or practitioners), or dependencies (e.g., on hyperscale cloud systems that provide the computing power for AI development) of European industries. These insights are important for interpreting abstract concepts, such as open strategic autonomy of the EU in the technology domain. However, they are also a decisive factor enabling European foreign policy practitioners to understand and engage with technical AI standardization, as standardization targets AI's key industrial inputs.

Create an interagency working group on technical AI standardization
In the U.S. context, the NSCAI report provides policy advice that can help increase cooperation on technical AI standards between different U.S. government agencies responsible for AI policy. The report calls on Congress to provide legislation that creates an "interagency AI group" on technical AI standardization that supports the National Institute of Standards and Technology (NIST) and the AI Standards Coordinator.[55] This interagency group is set to be staffed with five full-time NIST employees and one full-time employee each from the Department of Defense, the Office of the Director of National Intelligence, the Department of Energy, the Department of Homeland Security, the U.S. Agency for International Development, and the State Department. Drawing five full-time employees from these U.S. departments and agencies confirms that AI standards can have an impact on a diverse set of policy areas reflected by these government departments and agencies. European foreign ministries should follow this U.S. example and champion the creation of similar domestic interagency groups concerned with technical AI standardization. This would directly serve the purpose of bringing the foreign policy perspective to the table and increase inter-ministerial cooperation on technical AI standards.

3.4. Limits of Engagement

To engage effectively in technical AI standardization, foreign policy makers need to understand its modus operandi, actors' logics, ambivalences, and red lines. Moreover, foreign policy makers pursue a different set of strategic goals than most actors that engage in technical AI standardization. Foreign policy makers seek to engage in AI standardization to anticipate policy relevance from standardization practice. This is clearly different and is likely to lead to suspicion among standardization experts and private corporations alike. Therefore, foreign policy makers should become familiar with the codes of conduct relevant for active participation in technical AI standardization.

Build knowledge of the operational intricacies of technical AI standardization
First, **standardization is at its best when it is global, and not duplicating any effort**. This is what standardization experts try to achieve. Therefore, standardization is usually pursued through international SDOs. This reduces the risk of duplication,[56] if it were not that regional standardization organizations, such as ESOs, can sometimes complicate things.[57]

Second, **standardization is a bottom-up process** in which actors from industry and academia identify standardization needs and pursue them within working groups at various standardization organizations. This explains the growing suspicion among standardization experts regarding the increased political influence on technical

AI standardization processes. Policy, by nature, is a top-down approach. Although European foreign policy makers may wish to help shape international AI standardization according to foreign policy needs, this may lead to increased tension between foreign policy makers and standardization experts from private companies, academia, and civil society participating in standardization. Instead, European foreign policy makers should integrate into existing bottom-up processes of technical AI standardization and work alongside actors from the private sector, academia, and the standardization ecosystem.

Third, **technical standards have only limited political legitimacy**. Not all societal sectors are integrated equally in standardization processes. Standard-setting is skewed toward the private sector. Even if more representatives from the public sector were to actively engage in creating technical AI standards, this would still not compensate for the lack of political legitimacy—unless they were officially nominated by constitutional bodies, such as a parliament.

Fourth, **technical AI standardization has hurdles typical of technical standardization**. Standardization projects can stretch over years, require permanent involvement, and demand agenda-setting capabilities that European foreign policy makers will partially lack, because they do not pursue solutions for technical problems. Instead, the involvement of these policy makers aims at persuading private companies, and technologists, to make sure their technical solutions meet the ethics requirements specified in a regulation. This requires European foreign policy makers to anticipate where industry agreements will converge into an industry standard and to emphasize the political implications of such an agreement to the contributing actors.

Understand the red lines

Private corporations, standardization experts, and standardization organizations draw certain red lines at the encroaching efforts of the policy level to exploit technical standardization for policy purposes. European foreign policy officers should be careful not to over-legalize or over-politicize technical standardization bodies, although they are becoming highly political. **International standardization organizations cannot cover gaps in policy making left by political institutions.** This is especially true for international AI policy, as states have not been able to create an international framework for regulating AI. Now that standardization organizations and private companies are experiencing the attention that technical standardization generates among policy makers, European foreign policy makers' activity within these circles should seek to not force their goals on a carefully oiled mechanism capable of fostering industry consensus but instead, play by the rules of the game.

3.5. Technical Standardization Is Highly Political

Consensus among actors involved in technical AI standardization shapes geopolitical and geoeconomic realities, but this is not something to be discussed during the effort to reach consensus among industry players on a particular technical AI standard. The sum of all standards, later embedded in AI products and services, is what creates new realities that can influence the global balance of power.

Private companies that create international standards in information and telecommunications technologies help shape interconnected technologies in a joint effort with other companies but engage in a fierce battle to bring their own technical solutions to fruition. This involves high levels of strategizing and negotiation. Therefore, technical standardization is a highly political endeavor, even without the active participation of policy makers.

The dominant actors in international standardization are aware of the geopolitical and geoeconomic implications of their work. However, standardization experts do not openly engage in a conversation on the geopolitical implications of their standardization efforts. This separates actors involved in technical AI standardization from (European) foreign policy makers engaged in AI regulation.

Policy practitioners directly address geopolitical and geoeconomic ramifications of increased competition for foundational and emerging technologies. However, standardization specialists deal with the intricacies of creating technical standards that help to enable their products and services to reach global markets. Of course, this creates new realities that might affect the global balance of power, but it is not the primary goal of engaging in bottom-up, consensus-based, international technical AI standardization.

Active engagement of European foreign policy makers in technical AI standardization can help anticipate what is unequivocally coming. This engagement can help inform governments about pending AI regulation, but it cannot help prevent how the private sector employs AI standardization to reach its primary objectives: interoperability of products and services, connectivity, and market access.

4. Conclusion

Technical AI standardization has a direct impact on traditional foreign policy domains, such as the protection of human rights and democracy, and foreign economic and trade policy. States are pursuing coordinated AI standardization strategies that reflect their geopolitical and geoeconomic goals. Thus, states perceive AI as a strategic economic resource that is essential for increasing their political influence globally. This development has the potential to shift the global balance of power.

Technical standardization is the private sector's approach to governing the use of AI technologies. This bottom-up process builds consensus among market actors that share an economic interest in the interoperability and connectivity of AI products and services, a precondition for achieving international market access. Although European foreign policy makers regulate AI technologies at the United Nations, UNESCO, and the OECD, or in the GPAI, they are absent from the technical AI standardization ecosystem, although it has a direct impact on their foreign policy agendas.

Technical standards help to gradually shape economic and political realities. They pave the way for industry adoption of AI products and services. Such standards are the basis for economic value creation associated with AI and are responsible for international diffusion of the technology. Technical standards carry political values that European foreign policy makers seek to promote internationally or to repel.

Active involvement requires direct participation of European foreign policy makers in standards working groups at national, regional, and international SDOs. If direct participation is not possible, for political reasons or because of a lack of resources, European foreign policy makers should at least closely monitor developments in technical AI standardization that are assessed as short-term and have a high impact on their governments' economic and foreign policy agendas. Additionally, they can empower civil society actors to participate in technical AI standardization processes, especially in the realm of AI ethics, pertinent to protection of civil and human rights internationally.

National AI standardization strategies should include a foreign policy perspective. As technical standards not only carry economic weight but also have political values, adding the foreign policy perspective helps to balance standardization strategies that would otherwise be skewed toward economic and industrial policy goals. By building coalitions and alliances among like-minded states, European foreign policy makers can help ensure that international AI standards reflect liberal democracies' core values manifested in the international human rights and trade regime.

European foreign policy makers must make the best possible strategic use of the opportunities available to them in engaging with AI standardization, rather than being forced to react to this highly dynamic process. To achieve this objective, European foreign ministries should redistribute resources to technical AI standardization. This requires European foreign ministries to reevaluate the strategic value they assign to tech policy. It is time that tech policy issues, such as AI standardization, become a strategic priority area of 21st-century foreign policy.

5. Annex

The annex lists three national AI standardization strategies—*US Leadership in AI: A Plan for Federal Engagement in Developing Technical Standards and Related Tools, China's Artificial Intelligence Standardization White Paper, the German Standardization Road Map on Artificial Intelligence*—and a supranational strategy report, *the Focus Group Report on AI Standardization*, published by the European Committee for Standardization (CEN) and the European Committee for Electrotechnical Standardization (CENELEC). The AI standardization strategies can be evaluated according six categories: *responsible political offices, federal involvement, degree of international promotion, key strategic insights, key technical insights, and treatment of personal data*.

The U.S. and Chinese AI standardization strategies are further contextualized with additional information based on the report of the National Security Commission on Artificial Intelligence and the Chinese Communist Party's Proposal on China's 14th Five-Year Plan.

The US's and China's approaches to AI standardization pursue a leadership narrative. China is striving for economic leadership achieved through technical (AI) standardization. The US is alarmed by this development and has emphasized the need to defend the "democratic alliance" led by the US. Although the EU has raised awareness of the shifting power balance and looming economic and political dependencies, the EU's AI standardization road map strikes a different tone. The road map focuses primarily on preserving EU values and laws. Therefore, its strategic outreach is limited to achieving sovereignty, trustworthiness, data protection, and further harmonization of the EU's internal market. The German standardization strategy, however, has even less international outreach and generally supports the EU's aims for achieving trustworthy AI. The German strategy also focuses on technical interoperability, data management, and data protection.

The Chinese government's approach to AI standardization

The Chinese government published its AI standardization strategy, the Artificial Intelligence Standardization White Paper, in May 2018[58]. It calls to lay the economic foundation that enables AI standardization, for instance, to enhance the financial support system for innovation and expenditure for standardization, to reinforce intellectual property protection, and to advance government activity regarding market efficiency.[59] The strategy has a strong international focus with a clear foreign economic policy angle. The white paper asserts that competitive strength in inter-

national AI product markets depends on technical AI standardization. Therefore, AI standards should be used to further China's AI industries' boom. The strategy perceives international AI standardization as "in its infancy" (in 2018, this assumption was correct) and advises the Chinese government to take advantage. The 14th Five-Year Plan proposed by the Chinese Communist Party (CCP) adds to the AI standards strategy in proclaiming active participation in the setting of international rules and standards for digital fields.[60] Capabilities for standards and patents will be equally strengthened during this process.[61]

The U.S. government's approach to AI standardization

Through Executive Order 13859 on Maintaining American Leadership in Artificial Intelligence,[62] then President Donald Trump requested the National Institute of Standards and Technology (NIST) issue a plan for federal engagement in the development of technical AI standards. NIST published its strategy[63] in August 2019. It calls on federal agencies to engage in AI standardization to promote U.S. global leadership in AI. The strategy has a clear foreign policy dimension. It calls for championing U.S. priorities globally in activities for developing AI standards. Strategic engagement with international parties should advance AI standards for U.S. economic and security needs. The National Security Commission on Artificial Intelligence (NSCAI) report adds to this rhetoric by evoking an "emerging technology coalition" that defends the integrity of international technical standards and that shares resources to defend against malicious uses of technology and the influence of authoritarian states in democratic societies.[64]

The EU's approach to AI standardization

The picture painted in the geopolitical debate—that Europe is caught somewhere between the US's and China's technological prowess—is not appropriate when considering the EU's AI standardization strategy. Instead, the CEN-CENELEC focus group report is straightforward in supporting the EU's regulatory approach to achieving trustworthy, human-centric AI. The report is outward facing but inward looking when it claims to prioritize international standards and trade, while it seeks to further the harmonization of the EU's internal market by developing European AI standards where international standards are either not available or do not support the European regulatory agenda. The report's foreign economic policy perspective is less pronounced but assertive when it proclaims that the EU should contribute more to activities in international AI standardization to ensure EU values are reflected in AI technologies. Although the report focuses on standardization needs that seek to safeguard European values, European AI standards might help achieve the EU's concept of open strategic autonomy. The report refers to three standardization items on *resilience and sovereignty*[65] that have recently begun to be explored in a CEN-CENELEC Workshop Agreement on Digital Sovereignty.[66]

	US	China	EU	Germany
Standardization strategy	National Institute of Standards and Technology (NIST): *U.S. LEADERSHIP IN AI – A Plan for Federal Engagement in Developing Technical Standards and Related Tools*; National Security Commission on Artificial Intelligence (NSCAI): Final Report	China Electronics Standardization Institute (CESI): *Artificial Intelligence Standardization White Paper*; Chinese Communist Party (CCP): Proposal on China's 14th Five-Year Plan	The European Committee for Standardization (CEN) and the European Committee for Electrotechnical Standardization (CENELEC): *CEN-CENELEC Focus Group Report – Road Map on Artificial Intelligence (AI)*	DIN and German Commission for Electrical, Electronic & Information Technologies of DIN and VDE: *German Standardization Road Map on Artificial Intelligence*
Responsible political office	National Science and Technology Council (NSTC) ML/AI Subcommittee defines Standards Coordinator responsible for AI standardization strategies	Standardization Administration of China (SAC) defines National AI Standardization General Working Group located at CESI and National AI Standardization Expert Advisory Group	CEN-CENELEC establishes the committee JTC 21 as a point of contact for the European Commission (EC) and for European standards developing organizations	DIN standardization committee "Information technology and applications" NA 043-01-42 AA

Federal involvement	• Need for federal agencies to engage in AI standardization to promote U.S. global leadership in AI:
	  – Monitoring
	  – Participating
	  – Influencing
	  – Leading
		• Enhance the financial support system for innovation
		• Increase the autonomy of research institutes
		• Reinforce intellectual property protection
		• Advance government activity regarding market efficiency
		• Tighten the relationship between government and business
		• Increase federal capital and enterprises, deepen federal involvement in the economy
			• CEN-CENELEC and the EC are strategically involved: Market-driven EU standards need to implement EU policies and legislation	• Need for interoperability models, basic AI safety standard, initial criticality testing, and use case evaluation
				• National implementation program "Trusted AI"

	US	China	EU	Germany
International promotion	*Strong promotion* • Advance AI standards for U.S. economic and national security needs through strategically engaging with international parties • Globally champion U.S. priorities in AI standards development activities • Accelerate information flow between like-minded countries • Defend integrity of international technical standards, share resources to defend against malicious uses of technology and influence of authoritarian states on democratic societies: The US plans to lead an "emerging technology coalition" • Develop international standards for developing, testing, and using AI-enabled and autonomous weapon systems • Track AI standardization strategies of foreign governments/entities	*Strong promotion* • Take advantage of AI standardization globally • Standardize strategies for whole fields, unified systems of standards • Use standards to promote China's AI industry boom • Accentuate that the competitive strength in international product markets depends on AI standardization • Track and establish research funding on a global level • Set up highly competitive digital industry clusters internationally • Revise regulatory system and promote principle of "same production lines, same standards, same quality" • Control global networks, standards, and platforms • Promote federal expenditure standardization	*Medium promotion* • International standardization • Promotion of values and trustworthiness • Harmonization of the EU's internal market • Promotion of the EU's technological change and interests in international standards • Promotion of international standards and trade and market harmonization	*Weak promotion (sovereignty focused)* • Competitors like China and the US pursue own interests which can contradict EU values • Norms and standards need to promote sovereignty, transparency, and a "moral compass"
Treatment of personal data	• Gain data discoverability and access to federal data authorized for public use to enable widespread training	• Leverage public data for broad AI training and state surveillance capabilities • Develop big data centers • Create a genetic data collection platform and giant genomic datasets	• Need for standardized generic multiple task datasets and for a global framework for data space and data protection • Standards must preserve privacy, accessibility, and interoperability, inform users about automated decision making, prevent misuse • Need for research and development (R&D) in data governance (data quality model for data features)	• Data protection as a quality feature of AI and a requirement for trustworthy AI • Data protection as part of the management system • Balance of data protection and data quality (as the two principles may be contradictory)

	US	China	EU	Germany
Strategic key insights	*Defense and leadership focus* • Need to establish a national and democratic alliance made known publicly • Policy recommendations in reaction to Chinese AI policy and AI standardization strategies • Key areas – Concepts and terminology – Data and knowledge – Human interactions – Metrics – Networking – Performance testing and reporting methodology – Safety – Risk management – Trustworthiness	*Economic and leadership focus* • General two-stage strategy 1. "Socialist modernization by 2035" 2. Establish China as a world power by 2050 • Construction of systems and capabilities for standards, measurement, and patents • Standards as control method compared to international order • Focus on AI, quantum information, integrated circuits, life and health, brain science, bioengineered breeding, aerospace technology, deep earth, and deep sea • "Deep integration of AI in all industries"	*Regulatory and human-centric focus* • Stronger EU contribution to standardization activities to ensure EU values • Need for a value-oriented mechanism to monitor, review, report, and advise on international AI standardization • Regulation of AI and establishment of trustworthy, human-centric AI • Key areas – Accountability – Quality – Data for AI – Security and privacy – Ethics – Engineering of AI systems – Safety of AI systems	*Regulatory and human-centric focus* • Human-centric AI (explainability, robustness, resilience, and EU values such as non-discrimination and privacy protection)
Technical key insights	• Flexible, robust, and common technical AI standards with clear design guidelines ensuring safety, interoperability, and cybersecurity • Standards for hardware • Standards for AI-enabled and autonomous weapon systems • Standards as an evaluation mechanism for AI systems • Need for standards-related complementary tools • Tools for capturing and representing AI knowledge and reasoning • Standardized data sets (metadata for training, validation, and testing)	• Need for system for AI industry standards and research on coordination of open source and standardization • Standards for neural network representation and model compression, machine learning and natural language processing (NLP) algorithm performance assessment, NLP semantic library aspects, information extraction specifications, textual content analysis aspects • Brain-based devices and strong AI • Gradual establishment of technical AI standards for universality, connectivity, industry applications, cybersecurity, and privacy protection • Promotion of standardization by industry alliances for self-driving cars, service robots, and other sectors • Development of smart weapons • Need to catch up with "developed nations," eespecially in areas of key equipment, high-end chips, major products, and systems	• R&D needs for AI from a standardization perspective – Symbolic approaches to AI – AI Data (data governance and handling) – Generic multiple task datasets – AI and ML algorithms – AI system architecture – Engineering of systems using AI – Privacy and Trustworthiness – Transparency and accountability – Explainability in particular for sub-symbolic AI/black box – Safety and security – AI and General Data Protection Regulation (GDPR), e.g., implementation of laws – Definition of trustworthiness and related standards fields – Robustness	• Terminology, Classifications, Elements of AI, and Data • Safety, Security, Privacy, and Quality • Responsible AI, Architecture, and legal conditions • Industry, Mobility, and Logistics • Construction and infrastructure • Resources and Sustainability • AI in the Health sector • AI in the Financial sector • AI in the Retail sector • AI in the Agricultural sector

References

1   Cf. Launch of the Global Partnership on Artificial Intelligence by 15 Founding Members. Ministère de l'Europe et des Affaires Étrangères. 2020. https://www.diplomatie.gouv.fr/en/french-foreign-policy/digital-diplomacy/news/article/launch-of-the-global-partnership-on-artificial-intelligence-by-15-founding.

2   Ibid.

3   Technical standardization is a form of private regulation, but it does not mean that "public" regulation does not apply to the private sector. Technical standardization remains voluntary, but it gives the presumption of compliance. Technical standards can impose de facto industry rules that have legal and market implications. Another difference is that technical standardization prescribes how, while regulation often restricts what can be done.

4   Joint Declaration between the Federal Ministry of Economics and Technology of the Federal Republic of Germany and the State Central Bureau of Quality Supervision, Inspection and Quarantine of the People's Republic of China on the Establishment of a Sino-German Commission for Cooperation in Standardization (in German). Bundesministerium für Wirtschaft und Technologie der Bundesrepublik Deutschland. 2011. https://www.bmwi.de/Redaktion/DE/Downloads/C-D/china-deutsch-chinesische-kommission-zusammenarbeit-normung.pdf?__blob=publicationFile&v=3""t.

5   Especially regarding the export of AI systems that incorporate technical solutions embodied in AI standards that can secure the protection of human rights abroad.

6   Cf. Proposal for a Regulation of the European Parliament and of the Council. Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts. European Commission. 2021. https://eur-lex.europa.eu/resource.html?uri=cellar:e0649735-a372-11eb-9585-01aa75ed71a1.0001.02/DOC_1&format=PDF.

7   Article 40 Harmonised Standards: "High-risk AI systems which are in conformity with harmonised standards or parts thereof the references of which have been published in the Official Journal of the European Union shall be presumed to be in conformity with the requirements set out in Chapter 2 of this Title, to the extent those standards cover those requirements." The articles in chapter 2 list the requirements specific to high-risk AI systems. Cf. article 40 and chapter 2 Proposal for a Regulation of the European Parliament and of the Council. Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts. European Commission. 2021. https://eur-lex.europa.eu/resource.html?uri=cellar:e0649735-a372-11eb-9585-01aa75ed71a1.0001.02/DOC_1&format=PDF.

8   Developed in the European Union's Standardization Organizations CEN, CENELEC, and ETSI. For additional details of the relationship between the EU Commission and the three ESOs, see the Regulation (EU) No 1025/2012 of the European Parliament and of the Council from October 25, 2012, on "European Standardisation." Official Journal of the European Union. 2012. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012R1025&from=EN.

9   Cf. p. 259-261, Section 1: China and the World. Belt and Road Initiative. USCC 2018 Annual Report to Congress of the U.S.-China Economic and Security Review Commission. 2018. https://www.uscc.gov/sites/default/files/2019-09/Chapter%203%20Section%201-%20Belt%20and%20Road%20Initative_0.pdf; Cf. China's Belt and Road: Implications for the United States. Council on Foreign Relations. 2021. https://www.cfr.org/report/chinas-belt-and-road-implications-for-the-united-states/findings; Chinese Interests Take a Big Seat at the AI Governance Table. Government and Industry Team to Shape Emerging AI Standards-Setting Process. Jeffrey Ding, Paul Triolo, and Sam Sacks. 2018. https://www.newamerica.org/cybersecurity-initiative/digichina/blog/chinese-interests-take-big-seat-ai-governance-table/; cf. Translation: Excerpts from China's "White Paper on Artificial Intelligence Standardization." Jeffrey Ding and Paul Triolo. 2018. https://www.newamerica.org/cybersecurity-initiative/digichina/blog/translation-excerpts-chinas-white-paper-artificial-intelligence-standardization/.

10   Cf. Artificial Intelligence Standardization White Paper. Published by the Chinese Electronics Standardization Institute (CESI) and the 2nd Industrial Department of the Standardization Administration of China (SAC). 2018. Translated by the Center for Security and Emerging Technology (CSET). 2020. https://cset.georgetown.edu/research/artificial-intelligence-standardization-white-paper/.

11   The Rise and Decline of U.S. ICT Dominance. Dan Steinbock. 2013. https://www.chinausfocus.com/peace-security/the-rise-and-decline-of-u-s-ict-dominance. A U.S. Grand Strategy for the Global Digital Economy. Robert D. Atkinson. 2021. https://itif.org/publications/2021/01/19/us-grand-strategy-global-digital-economy.

12   AI Governance through Political Fora and Standards Developing Organizations – Mapping the actors relevant to AI governance. Philippe Lorenz. 2020. https://www.stiftung-nv.de/sites/default/files/ai_governance_through_political_fora_and_standards_developing_organizations.pdf.

13   For all, see Artificial Intelligence and Foreign Policy. Ben Scott, Stefan Heumann, and Philippe Lorenz. 2018. https://www.stiftung-nv.de/sites/default/files/ai_foreign_policy.pdf.

14   Especially when the live data consumed by these systems differ fundamentally from the data on which the machine learning models had been trained and tested (data shift), for instance, due to strong variance in data attributes that can represent skin color and discrepancy in data quality, e.g., high versus low image resolution. See Google's Medical AI Was Super Accurate in a Lab. Real Life Was a Different Story. Heaven. 2020. https://www.technologyreview.com/2020/04/27/1000658/google-medical-ai-accurate-lab-real-life-clinic-covid-diabetes-retina-disease/; The Way We Train AI Is Fundamentally Flawed. Heaven. 2020. https://www.technologyreview.com/2020/11/18/1012234/training-machine-learning-broken-real-world-heath-nlp-computer-vision/.

15   An overview of model explainability in modern machine learning. Rui Aguiar. 2019. https://towardsdatascience.com/an-overview-of-model-explainability-in-modern-machine-learning-fc0f22c8c29a; Transparency as Design Publicity: explaining and justifying inscrutable algorithms. Michele Loi, Andrea Ferrario, and Eleonora Viganò. 2020. https://link.springer.com/article/10.1007/s10676-020-09564-w.

16   See Cf. p. 6, Section 1: Understanding AI through its Core Components. Demystifying AI & AI Companies – What foreign policy makers need to know about the global AI industry. Philippe Lorenz and Kate Saslow. 2019. https://www.stiftung-nv.de/sites/default/files/demystifying_ai_and_ai_companies.pdf.

17   See Cf. p. 13 et seqq. Demystifying AI & AI Companies – What foreign policy makers need to know about the global AI industry. Philippe Lorenz and Kate Saslow. 2019. https://www.stiftung-nv.de/sites/default/files/demystifying_ai_and_ai_companies.pdf.

18   The European Commission gives a definition for open strategic autonomy that might indicate the EC's future official definition of the concept: "The ability to shape the new system of global economic governance and develop mutually beneficial bilateral relations, while protecting the EU from unfair and abusive practices, including to diversify and solidify global supply chains to enhance resilience to future crises". Cf. p. 7: The Commission Staff Working Document. Strategic Dependencies and Capacities. Accompanying the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Updating the 2020 New Industrial Strategy: Building a Stronger Single Market for Europe's Recovery. Staff and joint staff working document (SWD) 351 final. 2021. https://ec.europa.eu/info/sites/default/files/swd-strategic-dependencies-capacities_en.pdf.

19   Cf. Supplement No. 4 to Part 744 – Entity List. Export Administration Regulations. Bureau of Industry and Security. 2021. https://www.bis.doc.gov/index.php/documents/regulations-docs/2326-supplement-no-4-to-part-744-entity-list-4/file; Sensetime and iFlytek, together with Alibaba, Tencent, and Baidu, make up China's AI National Team. Each member is responsible for creating an open innovation platform. Sensetime is responsible for "intelligent vision"; iFlytek is responsible for "intelligent voice." See ChinAI Newsletter #51: China's AI "National Team." Jeffrey Ding. May 20, 2019. https://chinai.substack.com/p/chinai-51-chinas-ai-national-team. https://www.bis.doc.gov/index.php/documents/regulations-docs/2326-supplement-no-4-to-part-744-entity-list-4/file; see also Senate Poised to Pass Huge Industrial Policy Bill to Counter China. David E. Sanger, Catie Edmondson, David McCabe, and Thomas Kaplan. The New York Times. June 7, 2021. https://www.nytimes.com/2021/06/07/us/politics/senate-china-semiconductors.html.

20   Supplement No. 4 to Part 744 – Entity List. Export Administration Regulations. Bureau of Industry and Security. 2021. https://www.bis.doc.gov/index.php/policy-guidance/lists-of-parties-of-concern/entity-list.

21   Artificial Intelligence Standardization White Paper. Published by the Chinese Electronics Standardization Institute (CESI) and the 2nd Industrial Department of the Standardization Administration of China (SAC). 2018. Translated by the Center for Security and Emerging Technology (CSET). 2020. https://cset.georgetown.edu/publication/artificial-intelligence-standardization-white-paper/.

22   U.S. Leadership in AI: A Plan for Federal Engagement in Developing Technical Standards and Related Tools. Prepared in response to Executive Order 13859. National Institute of Standards and Technology (NIST). 2019. https://www.nist.gov/system/files/documents/2019/08/10/ai_standards_fedengagement_plan_9aug2019.pdf.

23   Draft AI R&D Guidelines for International Discussions. The Conference toward AI Network Society. Committee on Impact and Risk Assessment. 2017. https://www.soumu.go.jp/main_content/000507517.pdf; Artificial Intelligence Technology Strategy. Strategic Council for AI Technology. 2017. https://ai-japan.s3-ap-northeast-1.amazonaws.com/7116/0377/5269/Artificial_Intelligence_Technology_StrategyMarch2017.pdf; Social Principles of Human-Centric AI. Council for Social Principles of Human-centric AI. 2019. https://www8.cao.go.jp/cstp/english/humancentricai.pdf.

24   Industrial Strategy. Artificial Intelligence Sector Deal. A Sector Deal between Government and the Artificial Intelligence (AI) Sector. Department for Business, Energy and Industrial Strategy & Department for Digital, Culture, Media and Sport. 2018. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/702810/180425_BEIS_AI_Sector_Deal__4_.pdf; Artificial Intelligence and Public Standards. A Review. The Committee on Standards in Public Life. 2020. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/868284/Web_Version_AI_and_Public_Standards.PDF; https://publications.parliament.uk/pa/ld201719/ldselect/ldai/100/100.pdf; https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/868284/Web_Version_AI_and_Public_Standards.PDF; AI in the UK: ready, willing and able? Select Committee on Artificial Intelligence. Report of Session 2017–19. House of Lords. 2018. https://publications.parliament.uk/pa/ld201719/ldselect/ldai/100/100.pdf.

25   German Standardization Roadmap on Artificial Intelligence. Deutsches Institut für Normung (DIN) & German Commission for Electrical, Electronic & Information Technologies of DIN and VDE (DKE). 2020. https://www.dke.de/resource/blob/2008048/99bc6d952073ca88f52c0ae4a8c351a8/nr-ki-english---download-data.pdf.

26   An Artificial Intelligence Standards Roadmap: Making Australia's Voice Heard. Standards Australia. 2020. https://www.standards.org.au/getmedia/ede81912-55a2-4d8e-849f-9844993c3b9d/1515-An-Artificial-Intelligence-Standards-Roadmap12-02-2020.pdf.aspx.

27   Road Map Report on AI. CEN-CENELEC. 2020. https://ftp.cencenelec.eu/EN/EuropeanStandardization/Sectors/AI/CEN-CLC_FGR_RoadMapAI.pdf.

28   The European concept of open strategic autonomy is the EC's attempt to establish exactly this. Cf. p. 4: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions. Trade Policy Review. An Open, Sustainable and Assertive Trade Policy. European Commission. 2021. https://trade.ec.europa.eu/doclib/docs/2021/february/tradoc_159438.pdf. How it will be enacted in a concrete policy remains to be seen.

29   As described in the National Security Commission on Artificial Intelligence (NSCAI) report. Final Report. National Security Commission on Artificial Intelligence (NSCAI). 2021. https://www.nscai.gov/wp-content/uploads/2021/03/Full-Report-Digital-1.pdf.

30   See the CCP's 14th Five-Year plan. Chinese Communist Party (CCP). 2020. Translated by the Center for Security and Emerging Technology (CSET). 2020. https://cset.georgetown.edu/wp-content/uploads/t0237_5th_Plenum_Proposal_EN-1.pdf, A Next Generation Artificial Intelligence Development Plan. State Council. 2017. https://d1y8sb8igg2f8e.cloudfront.net/documents/translation-fulltext-8.1.17.pdf, Made in China 2025《中国制造 2025》. State Council. 2015. http://www.cittadellascienza.it/cina/wp-content/uploads/2017/02/IoT-ONE-Made-in-China-2025.pdf.

31   The problem of international economic relations often boils down to the fact that not all countries at the global level support equal standards of democracy and human rights protection.

32   See the description of the "Structure and Functions of a Typical SIG" provided by the Association for Computing Machinery. 2021. https://www.acm.org/special-interest-groups/volunteer-resources/officers-manual/structure. Another example are SIGs that formed out of the work of members of the Internet Technical Committee at IEEE ComSoC. https://itc.committees.comsoc.org/special-interest-groups/. Or the Hyperledger Telecom Special Interest Group "focused on technical and business-level conversations about appropriate use cases for blockchain technology in the Telecom industry." 2021. https://wiki.hyperledger.org/display/TCSIG/Telecom+SIG.

33   For additional details of the relationship between the EU Commission and the three ESOs, see the Regulation (EU) No. 1025/2012 of the European Parliament and of the Council from October 25, 2012, on "European Standardisation." Official Journal of the European Union. 2012. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012R1025&from=EN.

34   Current members of CEN include NCs of all European member states, three NCs of the EFTA members Iceland, Norway, and Switzerland, and NCs of the UK, North Macedonia, Turkey, and Serbia. https://standards.cen.eu/dyn/www/f?p=CENWEB:5:0::NO.

35   Current members of CENELEC include NCs of all European member states, three NCs of the EFTA members Iceland, Norway, and Switzerland, and NCs of the UK, North Macedonia, Turkey, and Serbia. https://www.cenelec.eu/about-cenelec/whoweare/ceneleccommunity/members/index.html.

36   Membership of ETSI. https://www.etsi.org/membership/members.

37   In the EU, NC membership categories vary. For a specific example, see the German DIN, c.f. p. 7 section 6 Membership: "Enterprises, institutions of higher learning, technical and industry associations, corporate bodies organized under private or public law, and other legal entities and partnerships may become members of DIN." https://www.din.de/resource/blob/66170/0ad27759be047557cf7654e1f4df824d/din-satzung-en-data.pdf.

38   At the IEEE, W3C, IETF, and ETSI, among others, which are also very important players in AI tech standardization, voting mechanisms depend on the respective member structure and specific ballot process. For the IEEE SA's balloting process, see https://standards.ieee.org/develop/balloting-standard/balloting.html. For the W3C's ballot process, see https://www.w3.org/2020/Process-20200915/. For the IETF's ballot procedure, see https://www.ietf.org/standards/process/iesg-ballots/. For the ETSI's voting procedure, see https://portal.etsi.org/Resources/Standards-Making-Process/Process, c.f. p. 19 et seqq. https://www.etsi.org/component/rsfiles/download-ile/files?path=Seminar%2Bslides%255CETSI%2BSeminar%2B7%2B-%2BApproval%2Bprocess%2Band%2BDecision%2B-making.pdf&Itemid=666.

39   The IEEE Global Initiative on Ethics of Autonomous and Intelligent Systems. IEEE SA. 2021. https://standards.ieee.org/industry-connections/ec/autonomous-systems.html.

40   Artificial Intelligence Systems (AIS) Related Standards. IEEE SA. 2021. https://standards.ieee.org/initiatives/artificial-intelligence-systems/standards.html#p7000.

41   ISO/IEC JTC 1/SC 42 Artificial Intelligence. ISO. 2021. https://www.iso.org/committee/6794475.html.

42   SEG 10 Ethics in Autonomous and Artificial Intelligence Applications. IEC. 2021. https://www.iec.ch/dyn/www/f?p=103:14:3781306954443::::FSP_ORG_ID,FSP_LANG_ID:23222,25.

43   Ibid.

44   External liaisons are given access to all relevant documentation and are invited to meetings. Additionally, the liaisons may nominate experts to participate in a working group. Category A liaisons are not allowed to vote but can comment on and propose new work items. C.f. p 19 AI Governance through Political Fora and Standards Developing Organizations – Mapping the actors relevant to AI governance. Philippe Lorenz. 2020. https://www.stiftung-nv.de/sites/default/files/ai_governance_through_political_fora_and_standards_developing_organizations.pdf.

45   Road Map Report on AI. CEN-CENELEC. 2020. https://ftp.cencenelec.eu/EN/EuropeanStandardization/Sectors/AI/CEN-CLC_FGR_RoadMapAI.pdf. The other two themes are *Data for AI and Engineering of AI systems*.

46   The ETSI standards address the European telecommunications industry. AI topics at ETSI focus on applications standards for future networks and security concerns. C.f. footnote 169, AI Governance through Political Fora and Standards Developing Organizations – Mapping the actors relevant to AI governance. Philippe Lorenz. 2020. https://www.stiftung-nv.de/sites/default/files/ai_governance_through_political_fora_and_standards_developing_organizations.pdf.

     https://ftp.cencenelec.eu/EN/EuropeanStandardization/Sectors/AI/CEN-CLC_FGR_RoadMapAI.pdf.

47   C.f. Rolling Plan for IT Standardization Artificial Intelligence, (A.2) EC Perspective and Progress Report: "It is expected that adequate standardisation shall be available to support that framework by the time it will become applicable. As a consequence of this, the most likely areas where new AI standards will be required are the ones which are addressed by the future requirements of the AI framework. They will be primarily: Training data, Record keeping, provision of information and transparency, robustness and accuracy, human oversight, testing." European Commission. 2021. https://joinup.ec.europa.eu/collection/rolling-plan-ict-standardisation/artificial-intelligence.

48   C.f. p. 7 AI Governance through Political Fora and Standards Developing Organizations – Mapping the actors relevant to AI governance. Philippe Lorenz. 2020. https://www.stiftung-nv.de/sites/default/files/ai_governance_through_political_fora_and_standards_developing_organizations.pdf.

49   Melanie Hart gives a good estimate of the costs of active participation in standard-setting: "It costs about $300,000 a year for one engineer to work on standards proposals and attend meetings all over the world, a price many small companies can't afford." Government Should Take Bigger Role In Promoting U.S. Technology or Risk Losing Ground to China, Commission Says. Jeanne Whalen. The Washington Post. December 1, 2020. https://www.washingtonpost.com/technology/2020/12/01/us-policy-china-technology.

50   This becomes obvious when the rhetoric of AI standardization strategies is considered. I.e., U.S. LEADERSHIP IN AI: A Plan for Federal Engagement in Developing Technical Standards and Related Tools. National Institute of Standards and Technology. 2019. https://www.nist.gov/system/files/documents/2019/08/10/ai_standards_fedengagement_plan_9aug2019.pdf, and CEN-CENELEC. 2020. https://ftp.cencenelec.eu/EN/EuropeanStandardization/Sectors/AI/CEN-CLC_FGR_RoadMapAI.pdf. See the annex for more information.

51   As a parallel, see, for instance, the Chinese proposals for standards facilitating "top-down internet control." Government Should Take Bigger Role in Promoting U.S. Technology or Risk Losing Ground to China, Commission Says. Jeanne Whalen. The Washington Post. December 1, 2020. https://www.washingtonpost.com/technology/2020/12/01/us-policy-china-technology.

52   See also From Private Regulation to Power Politics: The Rise of China in AI Private Governance through Standardisation. Marta Cantero Gamito. 2021. http://dx.doi.org/10.2139/ssrn.3794761.

53   Dual-Use Trade Controls. European Commission. 2021. https://ec.europa.eu/trade/import-and-export-rules/export-from-eu/dual-use-controls/.

54   Cf. p. 6, Section 1: Understanding AI through its Core Components. Demystifying AI & AI Companies – What foreign policy makers need to know about the global AI industry. Philippe Lorenz and Kate Saslow. 2019. https://www.stiftung-nv.de/sites/default/files/demystifying_ai_and_ai_companies.pdf.

55   Cf. Chapter 15 "A Favorable International AI Order", Item 4. Final Report. National Security Commission on Artificial Intelligence. 2021. https://www.nscai.gov/wp-content/uploads/2021/03/Full-Report-Digital-1.pdf.

56   The Vienna Agreement Lays Out the Details for Cooperation between CEN and the ISO. ISO and CEN. 2001. https://isotc.iso.org/livelink/livelink/fetch/2000/2122/3146825/4229629/4230450/4230458/01__Agreement_on_Technical_Cooperation_between_ISO_and_CEN_(Vienna_Agreement).pdf?nodeid=4230688&vernum=-2; the Frankfurt Agreement Specifies the Details of Cooperation between CENELEC and the IEC. IEC and CENELEC. 2016. https://www.iec.ch/about/globalreach/partners/pdf/IEC-CENELEC_Frankfurt_Agreement%7B2016%7D.pdf; a Memorandum of Understanding between ETSI and ITU, aimed at strengthening the information exchange and cooperation on technical standardization activities, was renewed in May 2016. ETSI and ITU. 2016. https://www.itu.int/en/ITU-T/extcoop/Documents/mou/MoU-ETSI-ITU-201605.pdf.

57   For details of the unique standardization system of the European Union, c.f. p. 28 section "CEN and CENELEC – The European Committee for Standardization and the European Committee for Electrotechnical Standardization", AI Governance through Political Fora and Standards Developing Organizations – Mapping the actors relevant to AI governance. Philippe Lorenz. 2020. https://www.stiftung-nv.de/sites/default/files/ai_governance_through_political_fora_and_standards_developing_organizations.pdf.

58   The original Chinese document can be found here: http://www.cesi.cn/images/editor/20180124/20180124135528742. pdf. Artificial Intelligence Standardization White Paper. Published by the Chinese Electronics Standardization Institute (CESI) and the 2nd Industrial Department of the Standardization Administration of China (SAC). 2018. Translated by the Center for Security and Emerging Technology (CSET). 2020. https://cset.georgetown.edu/publication/artificial-intelligence-standardization-white-paper/.

59   Ibid.

60   C.f. p. 11 The Chinese Communist Party (CCP) proposal—approved at the Fifth Plenum of the 19th CCP Central Committee in late October 2020—on China's 14th Five-Year Plan. Translated by the Center for Security and Emerging Technology (CSET). 2021. https://cset.georgetown.edu/wp-content/uploads/t0237_5th_Plenum_Proposal_EN-1. pdf. In a broader context, China's AI standardization strategy is also addressed in the China Standards 2035 Plan. The China Standards 2035 Plan unites the Belt and Road Initiative, the Strategic Emerging Industries Initiative, and the Made in China 2025 into a single industrial strategy until 2035. The China Standards 2035 Pan is still in development and aims to promote and expand China's national standards on the international level. AI is a central element of the plan. See China Standards 2035. Horizon Advisory. 2021. https://www.horizonadvisory.org/china-standards-2035-first-report; see ChinAI Newsletter #124: China Standards 2035 – Coming Soon. A national standard framework for new generation AI. Jeffrey Ding. December 21, 2020. https://chinai.substack.com/p/chinai-124-china-standards-2035-coming?token=eyJ1c2VyX2lkIjo4MTMxMDAzLCJwb3N0X2lkIjoyNTQyMTk1NywiXyI-6IkhrUENzIiwiaWF0IjoxNjI3OTk2NDc2LCJleHAiOjE2MjgwMDAwNzYsImlzcyI6InB1Yi0yNjYwYiwic3ViIjoicG9zdC1y-ZWFjdGlvbiJ9.tagrlLhkZUP69ZOQ924hoEkunZ_KYY4-Neh0S-3oeRc; Identity in a Multi-polar World and China's 2035 Standards. On the Role of "Digital Identity Standards" in E-Commerce, Supply Chain, Global Trade & Customs. Carsten Stöcker. 2021. https://medium.com/spherity/identity-in-a-multi-polar-world-and-chinas-2035-standards-66f14865b800.

61   C.f. p. 11 The Chinese Communist Party (CCP) proposal—approved at the Fifth Plenum of the 19th CCP Central Committee in late October 2020—on China's 14th Five-Year Plan. Translated by the Center for Security and Emerging Technology (CSET). 2021. https://cset.georgetown.edu/wp-content/uploads/t0237_5th_Plenum_Proposal_EN-1. pdf.

62   Executive Order 13859 of February 11, 2019. Maintaining American Leadership in Artificial Intelligence. 2019. https://www.federalregister.gov/documents/2019/02/14/2019-02544/maintaining-american-leadership-in-artificial-intelligence.

63   U.S. LEADERSHIP IN AI: A Plan for Federal Engagement in Developing Technical Standards and Related Tools. National Institute of Standards and Technology. 2019. https://www.nist.gov/system/files/documents/2019/08/10/ai_standards_fedengagement_plan_9aug2019.pdf.

64   C.f. p. 519 National Security Commission on Artificial Intelligence (NSCAI) report. Final Report. National Security Commission on Artificial Intelligence (NSCAI). 2021. https://www.nscai.gov/wp-content/uploads/2021/03/Full-Report-Digital-1.pdf.

65   C.f. p. 37 1) framework for regional digital sovereignty (including sovereignty ontology), 2) impact of sovereignty on standardization, 3) framework for digital identity of data for AI. Road Map Report on AI. CEN-CENELEC. 2020. https://ftp.cencenelec.eu/EN/EuropeanStandardization/Sectors/AI/CEN-CLC_FGR_RoadMapAI.pdf.

66   CEN-CENELEC Workshop announcement – Digital sovereignty – European perspective, general approach and implications on standardization. CEN-CENELEC. 2021. https://www.cencenelec.eu/news/workshops/Pages/WS-2021-012.aspx.

About the Stiftung Neue Verantwortung

The Stiftung Neue Verantwortung (SNV) is an independent, non-profit think tank working at the intersection of technology and society. The core method of SNV is collaborative policy development, involving experts from government, tech companies, civil society and academia to test and develop analyses with the aim of generating ideas on how governments can positively shape the technological transformation. To guarantee the independence of its work, the organization has adopted a concept of mixed funding sources that include foundations, public funds and corporate donations.

About the Author

Philippe Lorenz is Project Director of the AI Governance project at Stiftung Neue Verantwortung (SNV). In this project, he explores the development of the global regulatory framework for artificial intelligence (AI) technologies. In addition to the regulation of AI, he analyzes governance processes that are shaped by private-sector actors, and how these processes interact strongly with policymaking. These governance processes include technical standardization and patenting of AI technologies.

The AI Governance project developed out of the Artificial Intelligence and Foreign Policy project, a cooperation between the SNV, the Policy Planning Unit of the German Federal Foreign Office, and the Mercator Foundation, of which Philippe assumed responsibility in June of 2018. It focused on analyzing the geopolitical and geoeconomic implications of AI for German and European foreign policy. During the first phase of the project, Philippe's emphasis lay on contextualizing AI and how recent advances in the technology affect foreign policy, as well as explaining AI and AI companies through their access to necessary inputs (e.g. data, hardware, software and talent), and reviewing the international AI ethics debate.

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