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Making Sense of Artificial Intelligence

Why Switzerland Should Support a Scientific UN Panel to Assess the Rise of AI

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Content

Executive Summary

English Artificial Intelligence (AI) is a general-purpose technology that is expected to transform almost all industries and has sharply risen on the global political agenda in recent years. In this policy paper we provide a brief overview of initiatives and issues in the global governance of AI. We particularly highlight gaps in the operationalization of ethical principles, the monitoring and forecasting of technical progress, global participation, and the development of a shared long-term vision for AI. Subsequently, we introduce the Intergovernmental Panel on Climate Change (IPCC) as a potential governance model to address some of these gaps and look at how this framework could be adapted to the context of AI. Specifically, we suggest that such an organization should be integrated into the United Nations, with government nominated scientists, three main working groups, regular reporting duties, qualified majority voting as well as measures for institutional flexibility.

In the last part, we look at concrete steps that Switzerland can take to strengthen the global governance of AI and help to establish an "IPCC for AI". This could either work through developing the Franco-Canadian proposal of a Global Partnership on AI (GPAI) in that direction or a new initiative in partnership with the United Nations Office at Geneva (UNOG). Our recommendations here particularly focus on strengthening Geneva as a neutral digital governance hub. Specifically, we recommend to 1) initiate a federal AI strategy, 2) create an International Geneva task force, 3) appoint a tech ambassador, 4) actively express interest to help design the GPAI, 5) offer Geneva as a host city for GPAI activities and 6) encourage UNOG to set up AI-specific institutions in Geneva. ●

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^{Deutsch} Künstliche Intelligenz (KI) ist eine universell einsetzbare Technologie, die fast alle Branchen verändern wird und in den letzten Jahren immer öfter auf der weltpolitischen Agenda stand. In diesem Diskussionspapier geben wir einen kurzen Überblick über Initiativen und Probleme im Bereich der globalen Gouvernanz von KI. Wir heben insbesondere Lücken bei der Operationalisierung von ethischen Grundsätzen, der Beobachtung und Vorhersage der KI-Entwicklung, dem Aufbau einer globalen Gemeinschaft, und der Erarbeitung einer gemeinsamen langfristigen Vision für die KI hervor. Anschliessend stellen wir das Intergovernmental Panel on Climate Change (IPCC) als mögliches Gouvernanz-Modell vor, welches helfen könnte diese Lücken zu schliessen, und aufzeigen, wie dessen Rahmenbedingungen an den Kontext der KI angepasst werden könnten. Konkret schlagen wir vor, dass eine solche Organisation in die Vereinten Nationen integriert wird, mit staatlich nominierten Wissenschaftlern, drei Hauptarbeitsgruppen, regelmässiger Berichterstattungspflicht, qualifizierten Mehrheitsbeschlüssen sowie Massnahmen zur institutionellen Flexibilität.

Im letzten Teil werden konkrete Schritte aufgezeigt, welche die Schweiz unternehmen kann, um die globale Gouvernanz der KI zu stärken und zur Schaffung eines «IPCC for AI» beizutragen. Dies könnte entweder durch die Ausgestaltung des französisch-kanadischen Vorschlags für eine Globale Partnerschaft für KI (GPAI) in diesem Sinne oder durch eine neue Initiative in Partnerschaft mit dem Büro der Vereinten Nationen in Genf (UNOG) erfolgen. Unsere Empfehlungen konzentrieren sich hier insbesondere auf die Stärkung Genfs als neutralen digitalen Gouvernanz-Hub. Konkret empfehlen wir, 1) eine KI-Strategie des Bundes zu initiieren, 2) eine Task Force zum internationalen Genf zu schaffen, 3) einen Technologiebotschafter zu ernennen, 4) aktiv Interesse an der Gestaltung der GPAI zu bekunden, 5) Genf als Gastgeber für GPAI-Aktivitäten anzubieten und 6) das UNOG zu ermutigen, KI-spezifische Institutionen in Genf einzurichten. ●

Français L'intelligence artificielle (IA) est une technologie polyvalente qui devrait transformer la majorité des industries et qui s'est imposée ces dernières années comme une priorité de l'agenda politique mondial. Dans ce document d'orientation, nous donnons un aperçu des initiatives et des enjeux liés à la gouvernance mondiale de l'IA. Nous soulignons en particulier les lacunes concernant la mise en œuvre des principes éthiques, le suivi et la prévision des progrès techniques ainsi que la participation mondiale et l'élaboration d'une vision commune sur le long terme de l'IA. Par la suite, nous présentons également l'exemple du Groupe d'experts intergouvernemental sur l'évolution du climat (GIEC) comme un modèle de gouvernance potentiel pour combler certaines de ces lacunes et examinons comment ce cadre pourrait être adapté au contexte de l'IA. Plus précisément, nous suggérons qu'une telle organisation analogue soit intégrée aux Nations Unies, avec des scientifiques désignés nommés par leur gouvernement, trois groupes de travail principaux, la nécessité de fournir des rapports réguliers, le vote à la majorité qualifiée ainsi que des mesures assurant la flexibilité institutionnelle.

Dans la dernière partie, nous examinons les mesures concrètes que la Suisse peut prendre afin de renforcer la gouvernance mondiale de l'IA et de contribuer à la création d'un " GIEC pour l'IA ". Cela pourrait se faire soit en adaptant la proposition franco-canadienne d'un Partenariat mondial sur l'IA (GPAI), soit en lançant une nouvelle initiative en partenariat avec l'Office des Nations Unies à Genève (ONUG). Dans ce cadre, nous préconisons de renforcer le rôle de Genève comme siège tournante et neutre et international de la gouvernance numérique. Plus précisément, nous recommandons 1) de lancer une stratégie fédérale en matière d'IA, 2) de créer un groupe de travail de la Genève internationale, 3) de nommer un ambassadeur technique, 4) d'exprimer activement un intérêt pour la conception du GPAI, 5) de proposer Genève comme ville hôte des activités du GPAI et 6) d'encourager l'ONUG à créer des institutions spécialisées dans l'IA à Genève. ●

1. Introduction

Artificial Intelligence (AI) is "the science and engineering of making intelligent machines".

Artificial Intelligence (AI) is "the science and engineering of making intelligent machines".[1] In the 1980s, the term was primarily used to describe expert systems based on if-then logic. Nowadays, the field is dominated by machine learning algorithms that derive subtle connections between features and outcomes on large data sets. This second wave of AI took off around 2012[2], driven by more computing power, bigger data sets and deep learning algorithms that use an enormous number of intermediate layers of artificial neurons between inputs and outputs. This has led to significant breakthroughs in areas such as computer vision (e.g. object recognition), language (e.g. speech recognition) and strategy games (e.g. Go).[3]

The current approach to the global governance of AI is fragmented, incidental and inadequate.

Progress and investment in AI have mostly been driven by the private sector, in particular US tech giants and their Chinese counterparts.

However, governments have increasingly started to view AI as a technology with strategic importance, due to its economic impact as well as its potential in military applications. Subsequently, countries such as China, the UK, France[4] and Germany[5] all have started to adopt more proactive policies to foster their local AI ecosystems. Whereas Europe is mostly concerned about losing its strategic autonomy, China's has the explicit ambition to become the world's uncontested leader in AI by 2030.[6]

AI is a general-purpose technology[7] coupled with extreme opportunities, but also extreme risks. In the near-term, the advances in areas such as machine perception will pervade economy and society, which will raise a lot of governance questions. The long-term prospect of high-level machine intelligence promises to be even more disruptive. An aggregate forecast of the world's top AI scientists puts a 50% chance of AI outperforming humans across all tasks in just 40 to 45 years.[8] Yet, the current approach to the global governance of AI is fragmented, incidental and inadequate.[9] Consequently, the voices calling for a comprehensive global governance response to ensure that AI is developed for the common good and in a controlled fashion have grown louder in recent years. For example, in 2018 Google CEO Sundar Pichai called for more global governance on AI, citing the model of climate change and the Paris Agreement.[10] Later that same year, France and Canada have vowed to create an International Panel on AI (IPAI), later renamed to Global Partnership on AI (GPAI), modeled on the Intergovernmental Panel on Climate Change (IPCC).[11]

This paper has three parts. First, we provide an overview of the current state of global AI governance in terms of key initiatives, issues and gaps. Second, we argue that an organization along the lines of an "IPCC for AI" could potentially address crucial gaps. As the Franco-Canadian proposal is still at an early stage, we will look at learnings from the IPCC, to provide input into how such a panel could be set up. Third, we recommend what specific steps Switzerland can take to strengthen the global governance of AI. This includes, supporting the Franco-Canadian efforts as well as more actively promoting International Geneva as a global AI governance hub. ●

2. Global Governance of AI

AI governance refers to the set of norms, laws and institutions meant to steer the development, application and consequences of artificial intelligence.

2.1 Issues

AI governance refers to the set of norms, laws and institutions meant to steer the development, application and consequences of artificial intelligence. As a general-purpose technology, AI touches upon almost all aspects of life. It transforms many existing governance issues, it creates new ones and it can even transform the tools of governing and international law itself.[12] It is beyond the scope of this paper to give anything close to a comprehensive overview.[13] However, we at least offer a rough distinction between a technical layer, governing the technology itself, and a societal layer, focusing on the aggregate social consequences of its application.[14]

      Examples of governance issues on the technical layer include topics such as safety, auditability, explicability, autonomy or product liability. How can we make sure that consequential decision-making algorithms are in compliance with fairness, accuracy and safety criteria? What level and type of human oversight is adequate in different contexts? Who is being held accountable for failures or malicious use of an AI product?

      Examples of governance issues on the societal layer include economic and political issues. AI is projected to increase productivity and

add 16 trillion dollars to the global economy by 2030.[15] However, at the same time - just as with other digital technologies - it could worsen income inequalities, due to large structural shifts in the labor market and the lack of tax neutrality between digital and brick-and-mortar businesses. A further question are the political effects of AI, such as how it influences opinion shaping in democracies or whether it will enable a third wave of autocratization with digital totalitarianism enabled by advanced face and lie recognition, social manipulation and ubiquitous sensors.[16] Lastly, there are also security issues, such as AI-enabled cybercrime[17], how AI might affect the strategic stability between great powers or whether the reliance on complex autonomous military systems with unpredictable interactions could raise the threat of inadvertent escalation.

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For most applications of AI that are currently deployed, the existing laws and regulations are sufficient. However, regulatory minimum standards for accuracy, explainability or liability of AI can make sense if adapted to very specific application contexts. Interesting in terms of global governance are primarily cases where individual or large-scale AI applications create significant economic, political or military externalities or infringe on human rights.

2.2 Efforts
This section is not intended to be comprehensive, but to give an approximate overview over initiatives that have been launched in recent years by international organizations and multinational enterprises.

Business, academia and civil society: In 2016 all major Western tech companies, including Google, Amazon, Facebook, Apple and Microsoft came together to build the industry consortium *Partnership on AI*, to formulate best practices on the challenges and opportunities within the field.[18] Since then it has grown to over 80 partner organizations

including many from civil society and academia as well as the Chinese tech giant Baidu. However, so far, it has not produced a lot of actionable work yet. In January 2017 the Future of Life Institute initiated the Asilomar AI principles, modeled on the Asilomar Conference on Recombinant DNA that provided voluntary guidelines for biotechnology.[19] The 23 principles have been signed by many of the world's top AI researchers. Various companies such as OpenAI[20], Microsoft[21] and Google[22] have also published principles that they will respect in their development and deployment of AI. Similarly, the University of Montréal has developed a set of ethical principles resulting in the Montréal Declaration for Responsible Development of Artificial Intelligence.[23] In 2019, a broad alliance in China containing the most prestigious universities as well as Baidu, AliBaba and Tencent endorsed the Beijing[24] AI Principles, which quite closely match ethical AI principles in the West.

> Various companies have published principles that they will respect in their development and deployment of AI.

Several non-profits, such as the Electronic Frontier Foundation[25], AI Impacts[26] or AI Index[27] have also engaged in efforts to monitor the progress of AI. A number of academic research centers focused on the governance of AI have been opened as well over the last few years. This inter alia includes the Center for the Governance of AI in Oxford or the Center for Security and Emerging Technology in Washington, D.C. In Europe, leaders from academia and business have also made several calls for the establishment of a pan-European, or even global[28], AI laboratory or network of laboratories. Most notably, the EL-LIS[29] and CLAIRE[30] proposals are competing for momentum through conferences, offices as well as the official support from governments. Lastly, the Institute of Electrical and Electronics Engineers (IEEE) has created working groups to develop industry standards.[31]

Switzerland: In autumn 2018, the Swiss Federal Council established an interdepartmental working group on artificial intelligence under the direction of the State Secretariat for Education, Research and

Innovation (SERI).[32] The aim of this working group is to facilitate the exchange of knowledge and opinions and the coordination of Swiss positions in international forums. In October 2019, it submits to the Federal Council an overview of existing measures, an assessment of new fields of action and considerations on the transparent and responsible use of artificial intelligence. However, contrary to many of its European neighbors Switzerland currently has no federal AI strategy.

European Union: In spring 2018, all 28 EU Member States plus Norway signed the "Declaration of Cooperation on AI", which calls for a comprehensive and integrated approach to boost Europe's technological capacity, address socio-economic challenges and ensure an adequate legal and ethical framework.[33] The Commission followed up with the "Coordinated Plan on Artificial Intelligence", which states the ambition to become world-leading in ethical and secure AI and aims to increase data availability and investment.[34] In April 2019, the High-Level Expert Group on AI published ethics guidelines for trustworthy AI[35] and the president-elect of the European Commission Ursula von der Leyen announced that she plans to introduce major legislation in that regard in her first 100 days in office.[36]

International institutions: The OECD has developed non-binding principles for trustworthy AI, which have been adopted by 42 countries, including Switzerland.[37] Furthermore, it is launching an AI Policy observatory. The G7 have signed the Charlevoix Common Vision for the Future of Artificial Intelligence to support human-centric AI and to facilitate a multistakeholder dialogue to inform policy discussion.[38] In June 2019, the G20 trade ministers have endorsed human-centered AI guided by the OECD AI principles.[39]

United Nations: The International Telecommunications Union (ITU) governs the 5G Network, which is crucial for the Internet of Things and AI, and also hosts the annual AI for Good Summit, that brings together leaders from governments, business and civil society to leverage AI for the accomplishment of the UN's Sustainable Development Goals.[40] In 2017 the International Organization for Standardization (ISO) has set-up a technical committee with seven working groups on

standardization in the area of AI.[41] The Convention on Certain Conventional Weapons (CCW) has a governmental group of experts, which discusses a possible ban of lethal autonomous weapon systems.[42] UNESCO is examining the ethics of AI.[43] The International Labour Organization (ILO) has a program that examines the impact of AI on labour markets.[44] UNICRI and UNESCO have also established research centers for Artificial Intelligence in The Hague and Ljubljana respectively. Lastly, UN Secretary-General António Guterres has convened a High-level Panel on Digital Cooperation.[45] However, these are all separate efforts and there is no overarching strategy or clear institutional focal point yet on how the UN approaches the long-term rise of AI.

2.3 Gaps

As previously stated, existing norms, institutions and regulations cover some current applications of AI. However, there are still considerable gaps in the global AI governance landscape. In particular, we want to highlight the following four areas that merit further attention:

> There are still considerable gaps in the global AI governance landscape.

Operationalization: There has been a flurry of ethical principles for AI over the last two to three years. However, except for parts of General Data Protection Regulation by the EU, very little new, AI-relevant legislation has been passed. Almost all these principles only include positive aspirational goals and lack specificity, which is linked to unclear definitions and rapid advances in the underlying technologies. However, without clear red lines, it is uncertain if they change the behavior of actors at all[46], which is why some have denounced AI principles as mostly being "ethics washing"[47], a public relations exercise meant to delay any meaningful regulation of the industry. The efforts to translate principles into more concrete standards that can be certified, such as by the IEEE and the ISO, are therefore an important next step.

Monitoring and forecasting: There is a tremendous amount of uncertainty regarding future timelines of AI capabilities and impacts. In

particular, the level of generality of the technology, as well as its broad effects on the economy, politics and the military. On the one hand, this calls for larger scale benchmarking, monitoring and horizon scanning. On the other hand, we need a better understanding of causal relations in those areas and the capacity to deal with unintended consequences. Weather and climate forecasts are great examples showing that forecasts of extremely complex processes can be systematically improved. However, while AI-systems are fed great amounts of data, there is not enough granular data about AI itself. For example, even something as basic as the distribution and evolution of the global digital computing capacity is not continually tracked by any institution.

Global community: Interest in AI governance has initially been pronounced most strongly in the West. However, in the long run everybody from Afghanistan to Zimbabwe is affected by the rise of AI. China in particular is poised to play a vital role in the future development of AI. Whereas the United States is still producing the most influential basic research, China is increasing its share of most cited papers rapidly.[48] Similarly, China's interest in the ethics and global governance of AI has surged with multiple high-level initiatives in 2019. Consequently, it is important to have both inclusive deliberation forums to gather global perspectives, as well as specific links between the Western and the Chinese AI communities that enable strong norms for the ethical use of AI even in the light of political tensions.

Shared long-term vision: There is an enormous amount of ambiguity regarding the desirability of different socio-technical arrangements for a future world pervaded by highly advanced AI. This lack of a clear goal state to steer towards to is a general feature of the international system. For example, countries had no long-term vision for the Internet either, but rather stumbled into it incrementally. Yet, with regards to the long-term prospect of high-level machine intelligence and potential aftermath scenarios[49], it seems especially important to start thinking about desiderata[50] well in advance. ●

3. Towards a Global Scientific Panel

France and Canada first proposed the establishment of an International Panel on AI (IPAI) in December 2018.

France and Canada first proposed the establishment of an International Panel on AI (IPAI) in December 2018. According to this mandate, the IPAI would promote the development of AI policies and the responsible use of artificial intelligence based on human rights and provide a "mechanism for the exchange of multidisciplinary analysis, foresight and coordination capabilities in the field of AI". In addition to its own work, the IPAI would have monitored and utilized national and international work in the field of AI. The IPAI has been endorsed by six of the seven G7 digital ministers in May 2019 in Paris.[51] However, possibly due to the opposition of the United States, the IPAI was not launched as originally planned within the G7 in Biarritz. Instead, French President Emmanuel Macron announced that the work on a rebranded Global Partnership on AI (GPAI) will continue in close collaboration with the OECD.[52]

As inter alia stated in Macron's speech to the Internet Governance Forum in 2018 the IPAI proposal is based on an analogy to the global governance of climate change (see box 1) and the Intergovernmental Panel on Climate Change (IPCC) in particular.[53] As an independent body established by the World Meteorological Organization and the UN Environment Programme, the IPCC set a widely recognized

example of a large, scientifically-driven platform for international consensus-building on the pace, dynamics, factors and consequences of climate change. The IPCC has three main working groups. The first one evaluates scientific basis of climate change, the second one looks at the impacts, adaptation as well as vulnerability, and the third one works on mitigation measures. The first assessment report of the IPCC has served as the basis for the creation of the United Nations Framework Convention on Climate Change (UNFCCC) culminating in the Paris Agreement. Accordingly, the creation of an "IPCC for AI" should help to build a solid base of facts and benchmarks against which progress can be measured.

The International Panel on AI (IPAI) has been endorsed by six of the seven G7 digital ministers in May 2019 in Paris.

The GPAI is still in the process of taking shape and many institutional design questions, such as how to include business and civil society, remain un- or underdefined. The Global Forum on AI for Humanity, from the 28th to 30th of October 2019 in Paris[54] will serve as a platform to help prioritize focus areas for the partnership. A global scientific organization can indeed be a crucial instrument to help fill the identified gaps in the global governance of AI. First, it accelerates operationalization by providing an overview over deployed policy tools and learnings from them. Second, it enables better monitoring and forecasting, by pooling experts and standardizing as well as expanding data collection. Third, it can help to foster a global community through interaction and common reference points, which can also be a basis upon which countries can work towards a long-term vision for AI and humans later on. With those goals in mind, we explore five key criteria of institutional design identified by Koremenos, Lipson & Snidal[55], which are membership, scope, centralization, decision-making process and flexibility.

Box 1

How does the rise of AI compare to climate change?

Structural commonalities: Both issues are characterized by high complexity and lots of uncertainty. Furthermore, climate change and the rise of AI are both global issues with significant transnational and transgenerational externalities. Consequently, the interests of future generations have to be considered in decision-making. Moreover, they can both be framed as collective action problems that require cooperation to avoid a regulatory race to the bottom,[56] which is particularly important due to extreme tail risks.

Structural differences: "Intelligence change" entails a much bigger upside potential than climate change, including the ability to better model and deal with complex issues, such as climate change. However, AI also has direct military applications making the risks of arms races or malicious use much more relevant. Overall, there is also much more ambiguity about the rise of AI than about the global rise in temperature. Whereas almost everyone seems to prefer no or very moderate global warming, there is no clear consensus on what kind of long-term AI future is the most preferable.

Interdependence: The computer hardware share of global energy consumption is rapidly increasing and could reach 20% (moderate scenario) to 50% (pessimistic scenario) by 2030.[57] At the same time AI could help to improve climate models and the efficiency of renewable[58] as well as fossil[59] energy sources. [60]

3.1 Membership
Membership by country
The idea of the IPAI was born within the G7 and then shifted towards the association of democratic market-economies, the OECD. New forms of digital authoritarianism are unquestionably concerning and the OECD seems to be the right forum to develop answers to this new challenge and to strengthen human rights. Nevertheless, AI research and development are global phenomena whose effects are felt beyond borders. Hence, we think that a science-driven body to monitor and forecast the development and implications of AI should be open to all countries. Global membership would mean better access to data from individual countries, increased legitimacy and authority of its reports, as well as more international exchange between scientists. However, not all countries will be interested or have the capacity to participate in such a panel from the beginning. Specifically, smaller countries have repeatedly called for an Internet governance helpdesk that supports governments in understanding digital issues, as they do not have the means to follow a decentralized, complicated discussion.[61]

In the IPCC, inclusion was achieved (see fig. 1) through travel grants as well as training to build up the capacities of smaller economies, which made up about half of the early IPCC budget.[62] While developing countries have a diverse set of experiences overall, we should expect most of them to support the global governance of AI as they lack the homegrown industry, market size, or even know-how to effectively regulate their behavior. They also have a particular set of concerns, such as whether automation may take away cheap manufacturing labor as a path to mature their economies or how technology transfers and shared benefits of AI can be ensured despite intellectual property rights.
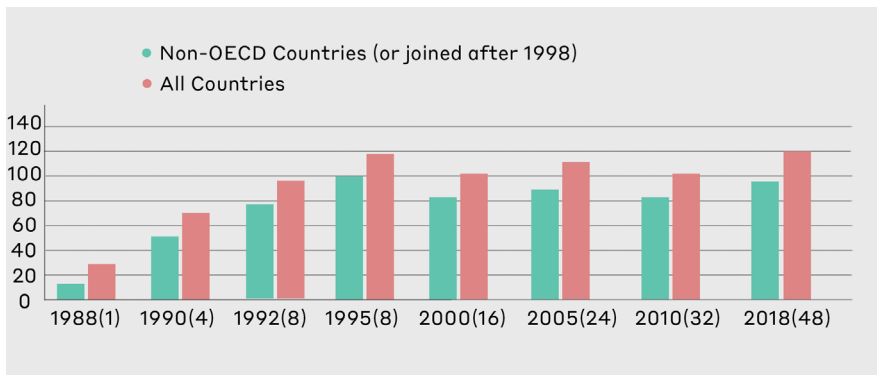
Figure 1: Number of Countries Participating in IPCC Plenary Sessions[63]

Thinking even further ahead than an "IPCC for AI" towards some eventual treaty that would formalize international coordination and duties, it might be advantageous to start with the smallest set of decisive parties as less parties can make progress towards any agreement faster and more feasible. However, a lack of input legitimacy might also mean that excluded states will evade or undermine rules set by the organization.[64]

Regional or sectoral forums can do excellent preparatory work, however, an "IPCC for AI" should be open to all countries and should seek to be legitimized and institutionalized within the United Nations. We suggest accelerating this process through affirmative multilateralism, meaning that developed countries financially support developing countries through travel grants and education to build up their governance capacities.

Membership by stakeholder type

In Internet governance there is traditionally a rift between the United States and tech companies on one side that favor a decentralized and largely non-governmental approach, and countries like China and Russia on the other side that strongly favor an intergovernmental approach.[65] In between these two extremes, there are many different formats that contain elements of both. One example would be the tripartite approach of the International Labour Organization, in which governments, employers and employees, all get an equal representation per country. Another example would be the IPCC, in which NGOs are only admitted as observer organizations, however, governments are expected to nominate technically competent scientists that engage in working groups. From these nominations, the working groups confirm lead authors and review editors for each chapter of their assessment.

Actors				Civil Society
			Affected stakeholders	Affected stakeholders
		External scientists / researchers	External scientists / researchers	External scientists / researchers
	Regulatory bodies / industry experts	Regulatory bodies / industry experts	Regulatory bodies / industry experts	Regulatory bodies / industry experts
Type of Participation	Use existing routines to assess risks and possible reduction measures	Maximise the scientific knowledge of the risk and mitigation options	Involve all affected stakeholders to collectively decide best way forward	Societal debate about the risk and its underlying implications
Dominant Risk Characteristic	Simple	Complexity	Uncertainty	Ambiguity

Figure 2: Stakeholder engagement escalator [67]

The resulting network of specialists can be said to have formed an epistemic community, a group which not only shares a similar understanding of facts but also develops basic norms and values.[66] Lastly, the International Risk Governance Council offers a decision-support tool (fig.2) to assess the need for stakeholder engagement.

Simple risks are known and understood. This is not yet the case for AI-related risks. Complex risks are more challenging to understand, e.g. because many variables are involved. This includes many AI issues such as deepfakes and computational propaganda. If uncertainty is pronounced, it is hard to put probabilities on outcomes and often unclear whether something is possible at all. This is for example the case in the context of AI capability timelines. If ambiguity is dominant, there is disagreement whether certain outcomes should be viewed as negative or beneficial. This is most pronounced for long-term AI scenarios.

Suggestion B

Any broadly accepted institution will have to make some compromise between advocates of non-governmental and intergovernmental approaches. We recommend largely following the IPCC model that is comprised of scientific experts nominated by countries. Business and civil society should be able to observe and submit materials to working groups without voting rights on the final assessment reports. For the questions with the strongest ambiguity, namely, which long-term AI futures are desirable, we suggest a broader dialogue with full inclusion of civil society, open consultation of the public and a secretariat that maps themes and ideas for a report.

3.2 Scope

According to the original mandate the IPAI aimed to "cover the field of AI and its impacts in a global and comprehensive manner by considering the perspectives related to (i) scientific and technological advances, (ii) economic transformation, (iii) respect for human rights, (iv) the collective and society, (v) geopolitical developments, and (vi) cultural diversity."[68] This aligns with the issues surrounding AI mentioned in the introduction of this paper. The scope of global AI governance bodies should follow the *subsidiarity* principle, focusing on those

tasks that cannot be performed equally well at a more local level.[69] For example, for the moment it probably makes most sense to decide on liability and insurance questions at national levels. Similarly, an "IPCC for AI" should be complementary and not rivalrous to existing efforts within the UN. What is missing is a central institution to understand the grand ethical challenges of AI in their entirety and ensure information exchange and compatibility between the different efforts.

Suggestion C

The main purpose of an "IPCC for AI" should be to reduce uncertainty and ambiguity regarding the speed, causes and macroscale effects of "intelligence change" and to foster the global epistemic community surrounding it. The organization could follow the IPCC with three main working groups on AI capability monitoring and forecasting, societal impacts of AI, and reviewing the effectiveness of mechanisms and policies to guide the development of AI. Those groups would again consist of many smaller subgroups that produce a global assessment report in regular intervals. Where efforts within the UN already exist, the respective institutions could lead the working groups.

3.3 Research and reporting duties

The least intrusive form of centralization is information collection. If countries still perceive this as too intrusive, they themselves can report on legal changes, initiatives and numbers with regards to AI governance challenges. If those reports are not reliable, civil society can still mount pressure through shadow reports.

The IPCC does not carry out original research, nor does it monitor climate or related phenomena itself. Rather, it assesses published literature (peer-reviewed and non-peer-reviewed). However, the IPCC can be said to stimulate research in climate science. Chapters of IPCC reports often close with sections on limitations and knowledge or research gaps, and the announcement of an IPCC special report can catalyze research activity in that area. A further advantage of having technical expertise at an international institution is that it can potentially provide decision-making support to countries with weak capabilities. However, conducting research in an organization with

hundreds of members with varying backgrounds can be a very slow and inefficient process. Furthermore, steering research rather than observing what emerges bottom-up can also lead to lock-in effects, whereby newer ideas and streams of literature are overlooked and discouraged.

Suggestion D

All members should be encouraged to regularly report on a list of items regarding their country's development in technical and societal AI governance issues to ensure information exchange and accountability. Similar to the IPCC, we do not recommend a global AI panel to conduct original research, as inclusive membership might make this too slow and political. However, we recommend exploring a separate research organization within the UN that has leaner structures and that can provide knowledge to other UN bodies as well as serve as an AI helpdesk.

3.4 Decision-making process

Should all members have equal weight in decision-making or not? The most common system in the United Nations is one country, one vote. However, institutions could also use systems such as weighted voting based on financial contributions or the democratic ideal of one person, one vote. Another element of control is what degree of consensus is required: A simple majority, a qualified majority, or unanimity.

The problem with consensus decision-making is that a few relatively insignificant parties can block findings that do not suit their agenda. Unanimous scientific agreement exists in almost no field, and as mentioned AI contains a lot of uncertainty. If consensus decision-making would be required for global reports of the "IPCC for AI", especially as it would grow to be more inclusive, this could degrade its work to lowest common denominator statements. In the IPCC, the consensus approach is considered to have led to a narrow representation of the climate problem, to less attention to weak signals of potential environmental catastrophe and matters on which there is no agreement. Overall, the failures to address the lack of knowledge and extreme risks have favored overconfidence and downplaying of the overall climate risks.[70] Instead of putting a very high ex ante epistemic bar on inclusion in reports, scientific debates could be highlighted within assessment reports.

We think that a one country - one vote system with a qualified majority could provide a balanced way forward. We do not recommend following the consensus approach of the IPCC, because it could incapacitate the organization. At the same time, only requiring a simple majority might undermine the authoritativeness of the report and large powers might be hesitant to join.

3.5 Flexibility

How flexible are institutional rules and procedures in the face of new circumstances or unanticipated shocks? This adaptive capacity seems especially important due to uncertainty regarding the future pace of progress in AI capabilities. In the IPCC, the assessment cycles have minimum times allocated to most steps and take five to seven years. However, the plenary session can accommodate emerging interests through special reports parallel to the general assessment reports. "Intelligence change" occurs at a significantly faster pace than climate change when comparing metrics such as the growth in digital computing capacity with the growth in man-made greenhouse gas emissions. Consequently, institutions tracking the development of AI should retain flexibility. ●

Explore assessment cycles that take less than five years. Have a mechanism that allows for special reports to deal with unexpected technical progress or impacts. Create a working group to identify potential warning signals of transformative artificial intelligence.

4. A Call to Action for Switzerland

As a small, neutral country with strong dependence on global trade, it has always been central to Switzerland's interest to promote global cooperation and a rule-based international order.

As a small, neutral country with strong dependence on global trade, it has always been central to Switzerland's interest to promote global cooperation and a rule-based international order. Switzerland has lifted its weight in the global community as a facilitator as well as by providing neutral scientific expertise. For example, as depository state of the Geneva Convention, host of the IPCC Secretariat, host of the European Organization for Nuclear Research (CERN), facilitator of the Montreux Document on private military and security companies or its Spiez laboratory to analyze evidence of chemical, biological or radiological attacks. Both the Digital Switzerland strategy[71] as well as the foreign policy vision for Switzerland in 2028[72] explicitly include the goal to strengthen Geneva as global center for digitization and technology governance. Consequently, we recommend that Switzerland joins the GPAI design efforts and helps to shape it as a global

science-based body and epistemic community that serves as a foundation to address global challenges related to the long-term increase in machine intelligence.

4.1 Geneva as global AI governance hub
Geneva is currently host to the second biggest cluster of UN institutions after New York. The main advantage of Geneva are the efficiency gains due to geographical distribution of UN institutions. This is especially relevant for the governance of AI, because it's a cross-cutting topic that has important overlaps with so many other issues. No other city has such a high concentration of UN institutions that are relevant and important to AI governance. Specifically, geographical proximity encourages more knowledge exchange through formal and informal channels. It also makes it easier for countries to follow the discussion, as they increasingly have representatives that follow topics rather than institutions. Consequently, Geneva is also an environmentally friendly choice, as topic leaders have to fly less to attend relevant meetings.

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Having world-class AI research at ETH Zurich (2nd in computer science worldwide in 2019 according to the Times Higher Education ranking), IDSIA and EPFL Lausanne (13th) - which also leads the Human Brain Project - fosters the credibility of Switzerland hosting a science-based body. Furthermore, it is an inclusive choice because even small and developing countries are represented in Geneva.[73] The same goes for tech companies, many of whom already have permanent representatives in Geneva. Moreover, Switzerland is a neutral country that proudly serves as a facilitator and mediator, which can

matter as great powers engage in strategic competition over AI to a certain degree. Lastly, Geneva is a safe city with a high living quality and a stable government. However, Geneva naturally also has a few disadvantages, such as high-living costs and fairness concerns in terms of the geographical distribution of UN institutions.

Box 2

Others move faster

All the rational advantages of Geneva cannot hide the reality that other governments have been more proactive in promoting their cities as global AI governance hubs. For example, the United Arab Emirates has initiated an annual Global Governance of AI roundtable (GGAR) in Dubai as a multistakeholder platform to shape "global, but culturally adaptable, norms for the governance of artificial intelligence."[74] Other cities such as Quebec or Singapore have invested a lot of money in new academic initiatives to lead the global governance of AI and the first two UN bodies that have established AI research centers have done so in The Hague (UNICRI) and Ljubljana (UNESCO). Lastly, in September 2019 the Canadian government announced a new centre of expertise that will support the work of the GPAI in Montréal.[75]

4.2 Next steps

If Switzerland wants to achieve its goal of bringing International Geneva into the 21st century, and to make use of its unique position in terms of trust, governance and research institutions in order to help the world to anticipate and deal with the consequences of the AI revolution, its efforts have to become more proactive and targeted as well as backed up with appropriate resources. Consequently, we make the following recommendations for Switzerland to position Geneva in the developing discussion on global AI governance:

General actions

1. The Federal Council initiates a federal AI strategy that includes foreign policy aspects and strengthens Switzerland as a European and global AI research hub.
2. The Federal Council creates a task force for concrete and coordinated action to bring institutions for the global governance of AI to Geneva. This task-force could be led by the Federal Department of Foreign Affairs and include members from the Federal Office of Communications, the SERI, the Geneva Science & Diplomacy Anticipator, the Canton and the City of Geneva and other relevant stakeholders.
3. Switzerland assigns a tech ambassador as link to big tech firms and norm entrepreneur for Swiss values in the digital space.

UN Panel / Global Partnership on AI

4. Switzerland actively expresses interest to support the Global Partnership on AI and helps shaping its work through participating at events such as the Global Forum on AI for Humanity in Paris.
5. Offers Geneva as a host city for a GPAI secretariat.
6. Encourages and supports the UN Office in Geneva (UNOG) or specific agencies located in Geneva, such as the ITU, to set up an AI research center and helpdesk in Geneva. ●

5. Conclusion

Making sense of artificial intelligence and strengthening the role of International Geneva as a digital governance hub.

In this policy paper we have provided a brief overview over some of the issues and initiatives for the global governance of AI. We have highlighted operationalization, monitoring and forecasting of technical progress, global participation and a shared long-term vision for AI as key gaps and shortcomings in the current regime. We then introduced the IPAI/GPAI, an idea put forward by France and Canada, as an initiative that could help to address some of these points. In order to develop global legitimacy and to learn from the successes and shortcomings of the IPCC, we have made suggestions to a) either integrate the GPAI process into the UN or, if that's not possible, initiate a new UN panel, b) with government appointed scientists, c) three main working groups, d) regular reporting duties, e) voting procedures that do not require unanimity as well as f) flexibility on special reports and faster assessment cycles.

Subsequently, we have looked at what concrete steps Switzerland can take to support the global governance of AI and help to shape the GPAI process. Our recommendations here center around more actively promoting Geneva as a neutral digital governance hub. This would inter alia include better coordination and more proactive communication with relevant stakeholders as well as more financial

support for new international institutions and research centers. Specifically, we recommend to 1) initiate a federal AI strategy, 2) create an International Geneva task force, 3) appoint a tech ambassador, 4) actively express interest to help design the Global Partnership on AI, 5) offer Geneva as a neutral place for GPAI activities and 6) encourage UNOG to set up AI-specific institutions in Geneva. ●

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