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Computing Global Justice

From AI Sovereignty to Just Technology Interdependence

By Martin Waehlich

Abstract

Artificial intelligence is usually described as a race in international affairs. The metaphor is catchy, but is often misleading. It directs attention to the fastest models, the largest investments and the countries thought to be ahead. However, the more essential contest is located at the foundation of the technology stack. It concerns the advanced chips, data centres, cloud accelerators, electricity, cooling and connectivity that make contemporary AI possible. Whoever controls that layer influences who can build AI, who can adapt it and who must accept the terms set by others.

Debate has begun to move beyond the ethics of individual AI systems toward the infrastructure that determines who can build, adapt and govern them.¹ AI is increasingly understood as a foundational layer of international order, while unequal control of compute is creating a political economy in which countries may supply data, labour, minerals and energy yet remain dependent on intelligence built elsewhere.² This development sharpens a question that international debate has barely begun to answer: what would global justice require in a world built on unequal access to computational power?

The divide below the model

The current language of AI diplomacy often answers this question by calling for access and capacity-building. But the relationships involved are more entangled than this language suggests. For instance, a country may host an international data centre while the profits leave and the demands on its electricity grid and water system remain. A ministry may obtain powerful GovTech services from a foreign technology provider, yet remain one export restriction, contractual change or price increase away from losing them.³

The global technology gap is not a hypothetical divide. Vili Lehdonvirta, Bóxi Wú and Zoe Hawkins map a world of “Compute North” countries hosting infrastructure relevant to AI development, “Compute South” countries oriented more toward deployment, and “Compute Deserts” with no

public-cloud AI compute at all. Their map also reveals an important jurisdictional consequence: states hosting infrastructure have greater leverage over the systems that run on it.⁴

Petros Terzis shows why this geography cannot be dismissed as a temporary market imbalance. Law helps to build this divide through intellectual property regulation, trade rules, subsidies and export controls that organize the global value chains through which chips, capital, data and computational services move. Meanwhile, regulation that concentrates only on the behaviour of finished AI systems misses the legal architecture of their production.⁵

The answer cannot be technological autarky. Demanding that every state reproduce the full AI stack would confuse justice with self-sufficiency. Interdependence can pool knowledge, lower costs and spread useful technologies, but the real issue is the terms on which that interdependence operates. Yiyi Chen, Zikang Chen and Na Yang show that technology transfer can expand adoption while also creating weak local absorption or vertical dependency.⁶ Imported capability is not the same thing as locally held power.

From access to just interdependence

Global justice gives us a better starting point than national rankings of computing capacity. Siavosh Sahebi and Paul Formosa use the capabilities approach to ask how AI affects what people are actually able to be and do, especially in lower-income countries.⁷ Lucia Rafanelli likewise reminds us that the relevant issue is not only whether an individual algorithm is fair. AI can reproduce structural and epistemic injustice by determining whose knowledge counts, whose choices are visible and who gets to exercise power through technical systems.⁸

Applied to compute, this suggests three conditions for just interdependence (Figure 1, see below). The first is *access*: reliable, affordable and continuous availability for research, public services and locally valuable innovation. A short-lived grant of cloud credits is useful, but it is not a durable development settlement.

The second is *agency*: countries and communities need the ability to choose the purposes for which AI is developed, to adapt systems to local languages and institutions, to audit what they procure and to sustain people who can build and govern those systems. Agency does not require every country to train a frontier model. It does require more than the ability to click “accept” on a service designed elsewhere.

The third is *counterpower*: the practical capacity to contest decisions, move between providers, influence standards and resist arbitrary exclusion. Henry Farrell and Abraham Newman have shown how control over network hubs can become a tool of coercion.⁹ Bernd Hoeksema's account

of digital domination adds the normative point: freedom is compromised when essential choices remain subject to uncontrolled power, even if that power is not exercised every day.¹⁰

These conditions also help distinguish dependence from domination. Not every reliance on a foreign supplier is unjust. Dependence becomes unjust when one side can set essential terms without a reasonable possibility of exit, contestation or participation, while transferring risks and costs to those with the least influence over the arrangement.

Compute has a material geography

The word “cloud” makes computational infrastructure sound weightless. At the scale of global affairs, compute has far-reaching economic, political and security effects. AI begins with mineral extraction and chip fabrication, and continues through construction, electricity generation, water consumption, labour and electronic waste. Parul Anand and Mark Coeckelbergh place these burdens within a global climate-justice framework.¹¹ Friederike Rohde and colleagues show why distribution is only part of the story. Procedure and recognition play an important role here: who participates in decisions about where infrastructure is built, whose needs are recognized and which human and ecological losses remain invisible.¹²

A programme that simply spreads more data centres around the world could reproduce the injustice it claims to address. A facility placed on a carbon-intensive grid or in a water-stressed region may increase national compute statistics while weakening the capabilities of the people living nearby. Just interdependence therefore needs an ecological condition. Communities bearing the material costs of AI must have a voice in siting and resource decisions, receive a fair share of the benefits and have access to credible remedies when promises are broken.

What international law can do

International law does not contain a free-standing right to a graphics processing unit. Nor can the language of human rights settle every allocation decision involving scarce and dual-use technologies. There is, however, more legal ground to work with than the prevailing debate acknowledges.

Article 15 of the International Covenant on Economic, Social and Cultural Rights recognizes the right to participate in and enjoy the benefits of scientific progress.¹³ In General Comment No. 25, the Committee on Economic, Social and Cultural Rights connects that right to participation in scientific progress, the development and diffusion of science, research infrastructure and international cooperation.¹⁴ Calvin Ho has already shown, in the field of AI-enabled healthcare, how the right to science can support collaborative, participatory and pluralistic regulatory governance.¹⁵

The careful claim is not that Article 15 already guarantees access to advanced compute. It is that access to finished AI products cannot exhaust the duties associated with scientific participation and cooperation. If research and public institutions cannot investigate, adapt or meaningfully shape technologies that become essential to health, education and administration, formal access may coexist with substantive exclusion.

Other fields carry part of the answer. International economic law shapes cloud services, intellectual property, competition, procurement and export controls. Environmental and climate law address the material burdens of infrastructure. Development cooperation determines whether capacity-building creates durable institutions or another cycle of vendor dependence. The UNESCO Recommendation on the Ethics of Artificial Intelligence¹⁶ and the Global Digital Compact¹⁷ supply political commitments to inclusion and capacity. What is missing is a framework that makes these strands speak to one another.

Forging a coalition for just compute

That framework need not begin with a new global authority. J. P. Singh, Manpriya Dua and Amarda Shehu describe AI infrastructure governance as multiplex: states, regions, firms, standards bodies and international organizations operate through overlapping networks, while countries outside the leading AI powers are not merely followers.¹⁸ This is exactly the setting in which a focused coalition can move first and broader multilateral rules can follow.

Such a coalition need not begin from scratch. The federated architecture of eduroam, GÉANT and the European Open Science Cloud¹⁹ shows that universities and public institutions can share identity, connectivity, data and computing services across borders without placing the entire infrastructure under one authority. A public-interest compute federation could extend this model to AI infrastructure. Its allocation rules should be transparent and give weight to public value, developmental need and neglected languages, rather than purchasing power alone. Public procurement and cloud contracts should require portability, interoperability, notice before critical services are withdrawn and access to independent review. Environmental obligations should cover the infrastructure's full lifecycle, including disclosure, community participation and local benefit-sharing. Governments with limited computing capacity should also receive funded technical representation in the standards bodies where architectural decisions quietly become policy.

The UN Technology Bank for the Least Developed Countries provides a complementary institutional foundation.²⁰ Its mandate already includes assessing technological needs, strengthening domestic scientific and technological capabilities, facilitating technology transfer and improving access to research and technical knowledge. It could serve as an institutional anchor for a public-interest compute federation by identifying country needs, representing least developed countries

and helping administer needs-based allocations. This would require a substantial expansion of its resources and technical capacity: the Technology Bank currently brokers knowledge and supports capacity-building, but does not own or federate large-scale computing infrastructure. Coupling its developmental mandate with the infrastructure and federated-access models developed by regional research networks would turn an existing institution into part of a more equitable global compute architecture.

Building this federation would also be an exercise in polycentric science diplomacy. As Jan Lüder and I argue, contemporary science diplomacy operates through multiple, overlapping centres of authority and expertise, including states, international organizations, universities, firms and standards bodies.²¹ It increasingly concerns the governance of infrastructure itself: the rules of access, interoperability, procurement and export control that determine who can participate, verify claims or escape dependency. A just compute coalition should therefore be understood not only as a mechanism for sharing scarce resources, but as an institutional framework for distributing authority over them. Its legitimacy would depend on whether less compute-rich countries can shape these rules from the outset, rather than being invited to participate after the architecture has already been settled.

These institutional proposals will not eliminate the strategic competition surrounding advanced computing. They would, however, make interdependence more contestable, reciprocal and capable of supporting public purposes.

Conclusion

Legitimate security restrictions will remain essential, but restrictions affecting scientific and developmental capacity should be publicly justified, proportionate and open to independent review. For instance, chokepoint power should not become self-justifying simply because it is exercised through private contracts or export-licensing decisions rather than traditional diplomacy.

I think “AI for All”²² must describe a position within the international system, not an invitation to consume whatever the system produces. If countries supply data, labour, minerals and energy but can only rent the intelligence created from them, they are included on unequal terms. Global justice begins when they can shape the purposes of AI, influence the rules governing its infrastructure, retain a fair share of the value and refuse arbitrary conditions. The task is not to end technology interdependence, but to make it just.



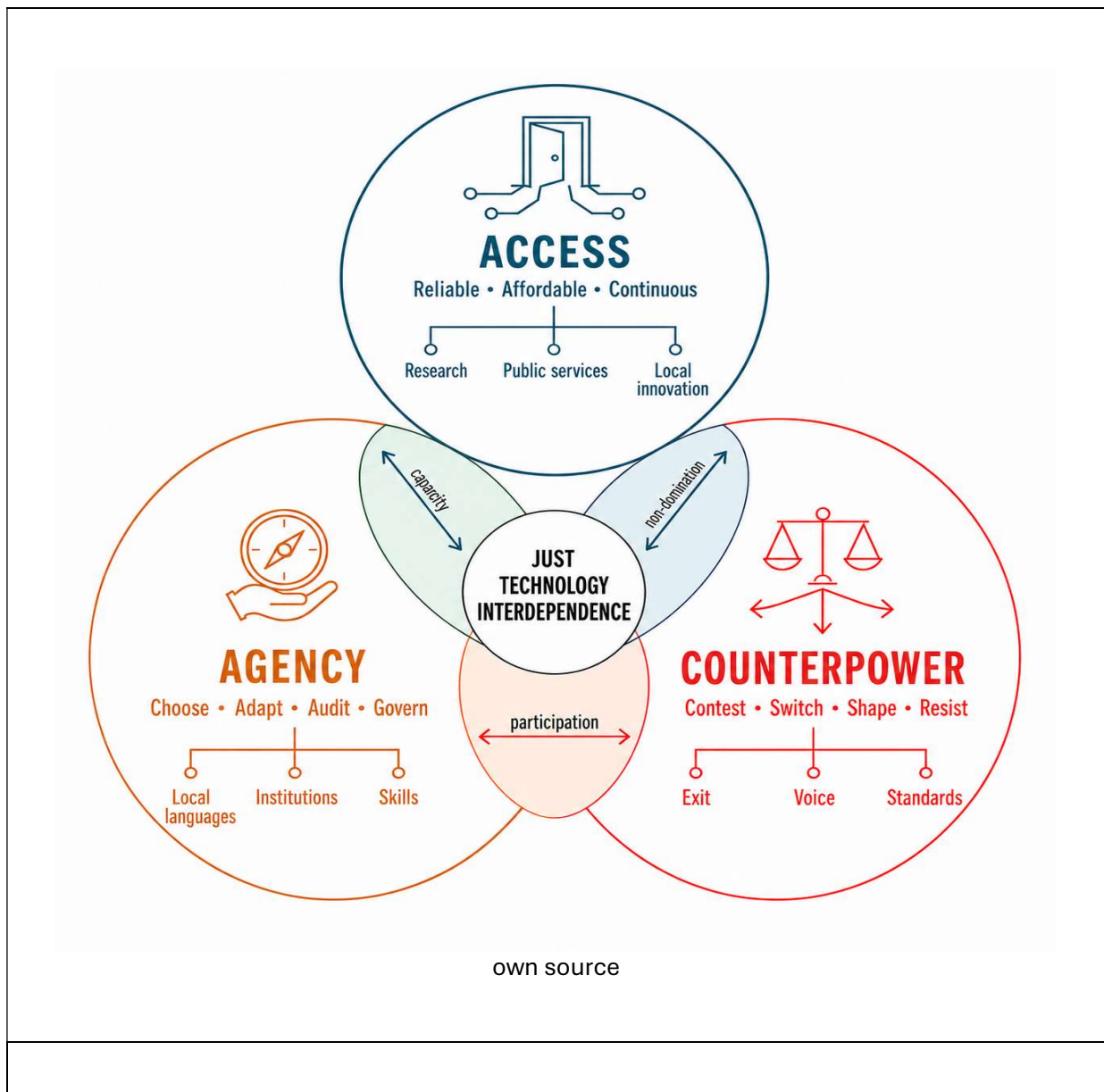
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Figure 1. *Three Conditions for Just Technology Interdependence in AI Compute*





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Endnotes

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