Technodiversity and the global majority:

(re)framing technology-oriented debates in the 21st century

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Technodiversity

Executive Summary

Technology-oriented debates in the 21st century have a tendency to replicate the prevailing, global narrative responsible for framing technology as an universally applicable force. **Technodiversity, a burgeoning school of thought, challenges this state of affairs**. It offers a competing perspective that ties the destiny of technological development and implementation to the diverse socio-cultural contexts from which it emerges, instead of an all-encompassing "universal history". This has important implications for current regulatory undertakings. See, for example, the AI Act in the European Union and the debates on regulating digital platforms in Brazil to, alongside other objectives, mitigate its potential negative effects on the rule of law.

With that in mind, this white paper will focus on two primary examples. First, how AI regulation may benefit from an enlarged understanding of "intelligence"[1] and, thus, break away from the apocalyptic discourse of an "AI singularity". Second, how our understanding of the relationship between technology and democracy can be enriched by critically assessing the epistemological foundations on which both AI and social media networks are grounded. This is one step towards a more systematic and practical setup for reframing contemporary debates, especially on tech policy, with technodiversity in mind. **All in all, this white paper calls for the foundation of a global, multistakeholder alliance to champion the cause of technodiversity, challenging the current technological development and fostering the imagination of other forms of technological thought and development .**

Introduction: The Concept of Technodiversity

The concept of technodiversity, as expounded by philosopher Yuk Hui, provides a critical lens through which to examine the prevailing discourse on digital technologies and their global impact. Hui's work challenges the dominant notion of a "universal history" that has persistently portrayed technology as a monolithic and universally applicable force, devoid of any meaningful and nuanced cultural or historical context.

In contrast, **Hui's pioneering perspective underscores the need for a paradigm**

1. Challenging the current state of technological development that is being championed by the school of thought that is represented by the acronym "TESCREAL" as coined by Émile Torres and Timnit Gebru, which stands forTranshumanism, Extropianism, Singularitarianism, Cosmism, Rationalism, Effective Altruism, and Longtermism. https://www.truthdig.com/articles/the-acronym-behind-our-wildest-ai-dreams-and-nightmares/

shift, one that reimagines technology as inherently tied to the diverse cultural, social, and historical contexts from which it emerges, and that allows us to reflect on diverse and decolonial technological futures. At the heart of Hui's concept is the idea that technology is not a uniform or universally applicable entity but a multifaceted construct, deeply rooted in the values and experiences of different localities.

Following Hui's path, this project emphasizes that technodiversity broadens and equally deepens our view, moving away from reductionist and determinist narratives that have dominated discussions surrounding technology. Instead of the grand, universal narratives of the "age of AI" or the impending "AI singularity", for example, technodiversity compels us to explore the intricate and context-specific manifestations of technology across different regions and histories and imagine futures that are not informed by a naive technological determinism. This shift prompts us to recognize the richness of technological ecosystems as they manifest in various cultural, geographical, and historical settings.

Technodiversity suggests a foundational principle for fostering a deeper understanding of technology and its implications in our interconnected and digital world. It invites us to consider the complex and concrete interplay between local knowledge systems, cultural practices, and technological innovations, which shouldn't be subordinated to mere efficiency and economic values.

We could illustrate this with an example in the realm of medical technology. In the context of technodiversity, the focus shifts from a singular vision of AI's role in medicine and its unified epistemological complex to a nuanced examination of how AI is applied and integrated into medical practices in different parts of the world, taking into consideration, for instance, the distinction between Chinese medicine and Western medical techniques and instruments. The epistemological differences refuse to be reduced to be homogeneous knowledge belonging to a single history.

Technodiversity offers a framework to appreciate the multiplicity of perspectives and practices that underpin technological development, allowing for a more inclusive, equitable, and culturally sensitive approach to the design, deployment, and regulation of technology on a global scale. By recognizing the significance of technodiversity, we can pave the way towards a more inclusive and context-aware discourse on the role of technology around the globe.

Reframing the discussion around AI policy and regulation through the lenses of technodiversity, for example, means abandoning the binary view that categorizes technology as either universally good or universally bad. This new approach

encourages a more nuanced and multifaceted conversation, moving beyond the misleading quest for one-size-fits-all technological (or even regulatory) solutions. Instead, it acknowledges the diverse cosmotechnics at play and highlights the multitude of technological solutions that may be context-dependent and shaped by a variety of local values, experiences, and cultural influences.

All in all, technodiversity calls for the reframing of technology-oriented debates in the 21st century, be it from the technical or regulatory perspective. This is especially urgent when one considers that we are in the process of discussing and implementing new normative frameworks for emerging technologies worldwide that will have a considerable impact on our shared digital experiences.

An exclusive Western or universalist approach to addressing pressing technology-related questions, such as the "AI Black Box" dilemma or the negative impacts of social media on democracy, can often lead to a philosophical impasse due to the shortcomings of the binary view mentioned above. It's essential to recognize that such challenges transcend geographical boundaries and require a more comprehensive perspective.

Technodiversity, in contrast, embraces the intrinsic diversity of technological systems and encourages us to approach these questions with a focus on locality. Just as discussions around biodiversity emphasize the variety of life forms, technodiversity reminds us to reflect on technological challenges from the standpoint of localities and cultural resources, which can offer fresh and innovative solutions to what might otherwise be perceived as insurmountable obstacles.

The significance of embracing technodiversity takes center stage in the pursuit of human development and fulfillment within the framework of the Anthropocene[2]. This epoch is marked by humanity's profound impact on Earth, and as our reliance on technology deepens in social, political, and economic contexts, it becomes imperative to remain vigilant about its interaction with a cornerstone of our shared human experience: diversity.

In our increasingly interconnected world, various modes of thought or rationality, often referred as "noodiversity", are more intricately intertwined than ever with the concept of technodiversity. This intricate web of relationships is responsible for nurturing biodiversity on a global scale, shaping the very fabric of our existence. However, within the relentless currents of technological competition and the emergence of new geopolitical narratives, we encounter the looming threat of perilous homogenization, potentially undermining the rich tapestry of diversifi-

2. HUI, Yuk. Rethinking technodiversity. **The UNESCO Courier**, Published on 31 March 2023. Available at <https://courier.unesco.org/en/articles/rethinking-technodiversity>.

cation that has historically characterized our world. As Yuk Hui aptly articulates, a possible solution lies in the pursuit of "reconciliation through diversification"[3].

While Hui's contributions are substantial, it's essential to acknowledge that a growing community of scholars and thinkers is actively contributing to this vital discourse. They not only expand upon Hui's philosophical undertakings but also delve into the practical implications of technodiversity, particularly from a geopolitical perspective. One such noteworthy voice is Domenico Fiormonte, who posits that technodiversity is one of the keys for digital decolonization[4]. In his perspective, the exercise of choice carries significant weight in cultural contexts where it may entail the rejection of technology perceived as invasive or harmful. Fiormonte's viewpoint underscores that technodiversity serves as a guardian for the self-determination of the "digital corpus," advocating for solutions that honor the ecological, cultural, and linguistic diversity of various territories and its populations. This expanded perspective enriches the ongoing conversation, encompassing not only the philosophical foundation laid out by Hui but also the critical implications of preserving cultural and territorial autonomy within the ever-evolving landscape of technology.

Following the discussion on technodiversity, this white paper will briefly consider two pivotal debates that can be greatly enriched by this philosophical turn: the erosion of democracy and the emergence of new technologies powered by Artificial Intelligence. Our objective is not to argue that these two debates are the most important ones, but rather to illustrate how one may apply the concept of technodiversity and, consequently, offer new alternatives to the challenges we now face. In other words, our objective is to **foster a better understanding of what technodiversity stands for and its main practical applications** against an ever-shifting global backdrop where technological developments are often perceived as "universal" and "necessary", disregarding the true meaning of democracy.

Moreover, we find it important to create a movement based on the firm philosophical foundations set out by Yuk Hui, Domenico Fiermonte, and others. By prioritizing community building, we believe that it is of utmost importance to **empower a global network of individuals and organizations to champion the cause of technodiversity, leading to a more equitable, culturally sensitive, and diverse technological future**.

3. *Ibidem*.

4. FIORMONTE, Domenico. Technodiversity as the key to digital decolonization. **The UNESCO Courier**, Published on 31 March 2023. Available at <https://courier.unesco.org/en/articles/technodiversity-key-digital-decolonization>.

Technodiversity and Artificial Intelligence

The emergence of Artificial Intelligence (AI) has been marked by significant historical milestones that have shaped the way we perceive and interact with technology. One of the pivotal moments in the early development of AI occurred in 1950 with the publication of Alan Turing's paper "Computing Machinery and Intelligence." In this landmark work, Turing articulated in academic terms the concept of a machine that could simulate human intelligence. He proposed what is now known as the Turing Test, a measure of a machine's ability to mimic intelligent behavior indistinguishable from that of a human[5]. This paper laid part of the modern philosophical foundation for AI studies and development by raising questions about the nature of human thought and the potential for machines to replicate it, setting the stage for subsequent research and exploration.

Another crucial moment in the history of AI was the 1956 Dartmouth College Conference, often referred to as the birth of AI as a formal discipline. At this conference, pioneers in the field, including John McCarthy and Marvin Minsky, gathered to discuss the possibility of creating machines that could perform tasks that require human intelligence and rationality. One year before, in a formal proposal for the conference presented to Dartmouth College, McCarthy, Minsky, and others stated that they were building upon "the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it"[6]. They believed that AI could solve complex problems, such as language translation and pattern recognition, and they set ambitious goals for the field. While the optimism at Dartmouth was high, the conference marked the beginning of decades of research and development to realize the potential of AI.

Fast forward to 2022, when the global release of ChatGPT consolidated another significant milestone in the history of AI. ChatGPT is a product of the deep learning revolution in AI development and a testament to the incredible advancements in natural language processing by algorithms. With its release, AI took a giant leap in its ability to behave as it "understands" natural language and,

5. One should not overlook, however, the looming gender question present in Turing's proposal. According to his version of the test, a human interrogator asks questions to two participants in another room to determine if he is interacting with a man or a woman. Both try to confuse the interrogator and convince him that he is interacting with the other participant (that is why Turing also calls it the "imitation game"). The idea, then, is to substitute one of the players for a computer to see if the interrogator can be fooled at the same rate when only humans were playing.

6. DICK, Stephanie. Artificial Intelligence. Harvard Data Science Review, 01 july 2019. Available at <https://hdsr.mitpress.mit.edu/pub/0aytgrau/release/3>.

therefore, generate human-like text, facilitating human-computer interactions at an unprecedented level. This moment underscores the rapid – and at times unchecked – development of AI and its potential to grasp a significant part of the complexity of human language from a computational standpoint. It also raises important ethical and societal questions about the responsible use of AI and its implications for various fields, from elections to employment.

Against this significant (albeit historically recent) backdrop, an important conversation on AI regulation gained traction. See, for example, the AI Act that was approved by the European Union Parliament in 2023 and is now undergoing a final round of negotiations. The regulation focuses on possible negative externalities of the technology and places AI on a spectrum ranging from low risk to unacceptable risk. This is set to become a very influential framework worldwide, following the now well-known "Brussels Effect"[7] that can also be identified in the field of privacy & data protection and platform regulation. See, for example, Brazil's Draft Bill n. 2.338/2023 that was heavily influenced by the European debate and also follows a risk-based approach instead of proposing a regulation of the technology itself. Moreover, the United States also joined the conversation in 2023 when President Biden issued a breakthrough "Administrative Order on Safe, Secure, and Trustworthy Artificial Intelligence", paving the way towards a more balanced framework for AI development and application.

Nonetheless, the concept of technodiversity challenges some of the preconceived notions on which these conversations are grounded. As Yuk Hui puts it, we should "liberate machine intelligence from the bias of certain notions of intelligence" so we can be free "to conceive new political ecologies and political economies of machine intelligence"[8]. To the author, the prevailing account of AI development – which was briefly presented above – casts a shadow on the "epistemological rupture" between a linear form of reasoning and recursivity, which lies at the foundation of new theories such as cybernetics and systems theory. Hui argues that "the recursive form allows the algorithm to effectively absorb contingency to improve computational efficiency"[9]. In other words, a recursive form of reasoning allows the machine to derive its rules from experience instead of depending solely on the rules set by its programmer. Modern AI-based technologies are capable, therefore, of non-linear reasoning, which differentiates them from a classic mechanistic thinking and moves them closer to the behavior of organisms. Exceeding the "soulless automaton" denounced by Renè Descarters, "the circular causality [...] seems to suggest a movement analogical to the soul: the soul is that which returns to itself in order to determine itself"[10].

7. BRADFORD, Anu. **The Brussels Effect**: How the European Union rules the world. Oxford: Oxford University Press, 2020.

8. HUI, Yuk. On the Limit of Artificial Intelligence. **Philosophy Today**, v. 65, i. 2, 2021, p. 341.

9. *Ibidem*, p. 343.

10. *Ibidem*, p. 344.

Even though the development of AI has moved in the past decades from a strict Cartesian rationalism (as philosopher Hubert Dreyfus has been ceaselessly criticizing since the 1960s) towards an empiricism that connects decisions to fact-based analysis, of which connectionism has been a paradigm, it undermines the diversity of intelligences and their complex relations to the world.[11] In Hui's words, paraphrasing Heidegger, "the world is constituted by a complex totality of references, and cognition depends on these references in order to reason"[12]. Despite observing the increasing power of AI, one should not lose sight of how the world itself is changing, moving away from a rich and complex phenomenological reality, due to an accelerating process of digitization, to a world increasingly determined by data and mathematical calculations. We are talking, therefore, of an intelligence that is computable (or recursively enumerable), which, as Hui aptly acknowledges, "is only one type of intelligence among many others"[13].

The very concept of technodiversity, as mentioned earlier, is intimately related to the concept of noodiversity, which refers to the diversity of reasoning or thinking. It is, therefore, a call to problematize and reconceptualize the very idea of intelligence baked into the field of Artificial Intelligence as a whole. See, for instance, how Chinese philosophy attributes intelligence to an intellectual intuition while western philosophers tend to reject this affirmation[14]. Yuk Hui, in light of this analysis, suggests that we should enlarge our understanding of intelligence in two ways in order to, consequently, enlarge our understanding of how technology works. First, intelligence should not be limited to calculability, as it is now considered and implied in the competition of computational power. Instead, it should take the ***incalculable***, which underlies in all spiritual lives, as its departing point. Second, intelligence should not be reduced to a homogenous universal model which currently leads to the search for a universal super-intelligence. Instead, as Hui puts it, AI should be informed by the goal of facilitating and not hindering noodiversity, which, in turn, fosters technodiversity and biodiversity[15].

All in all, this means that we should not focus on the pursuit of a universal AI driven by speed and efficiency. Instead, AI needs to be assessed from the point of view of an enlarged conception of intelligence alongside various and diverse modes of reasoning or thinking (noodiversity). It is this recognition that will lead us to consider alternative paths and, moreover, meditate on the possibilities of AI beyond a universal super-intelligence (or on how to prevent this illusion from driving us towards the abyss). This should include a discussion on the diversity

11. *Ibidem*, pp. 345-46.
12. *Ibidem*, p. 347.
13. *Ibidem*, p. 349.
14. *Ibidem*, pp. 351-54
15. *Ibidem*, p. 354.

of intelligences, the development of algorithms that power AI-based solutions and the implementation and application of AI tools under diverse circumstances.

This universalist undertaking distracts us from a more fruitful debate on how AI can advance, instead of hinder, technodiversity and how this, in turn, can have a positive impact on the development of noodiversity and biodiversity. Hence, regulators and policymakers around the world must consider technodiversity as an element when drafting and implementing new normative frameworks for AI, contributing to the creation of a more diverse (instead of monolithic) technological future. This means exploring other paths beyond the prevailing narrative, which is built on an universal (and, therefore, questionable) approach to technology.

Technodiversity and Democracy

The significance of democracy and the rule of law in our society cannot be overstated, serving as the foundational principles that underpin civil rights, liberties, and governance. However, in recent years, the emergence of new digital technologies, particularly artificial intelligence and social media platforms, has challenged not only democratic practices in general but also concepts closely related to democracy such as public sphere, freedom of speech, etc. These technologies have significantly impacted our democratic landscape, casting confusions and at the same time also introducing new opportunities that demand our attention and critical reflection.

One of the concerning aspects of the digital age is the concept of democratic erosion, a phenomenon where democratic principles and norms face a steady decline, sometimes imperceptible, over time. Democratic erosion, in contrast to democratic breakdown, makes it hard for us as a society to identify a single turning point. Or, as political scientist Nancy Bermeo argues, “democracies are now more likely to erode rather then to shatter”[16]. Social media platforms have played a pivotal role in facilitating the spread of disinformation, the polarization of political discourse, and the erosion of trust in democratic institutions. The rapid dissemination of false information and the echo chamber effect on social media can sway public opinion and even influence electoral outcomes. Simultaneously, artificial intelligence has amplified these concerns by automating the spread of misleading content, potentially making it even more challenging to identify and combat disinformation.

16. BERMEO, Nancy. On Democratic Backsliding. **Journal of Democrac**y, v. 27, n. 1, 2016, 5-19.

On the other hand, social media platforms and artificial intelligence have the potential to enhance democracy by promoting transparency, citizen engagement, and accountability. After all, new technologies can be used as positive instruments or weapons depending on how they are built, who controls them, and to what goals they are employed. They could enable individuals to participate in public discourse, mobilize for social and political causes, and access information more easily than ever before. In electoral contexts, for instance, social media and AI can serve as powerful tools for political campaigns to reach a wider audience and connect with voters. Technology, therefore, can also work in favor of democracy and be implemented in ways that strengthen rather than hinder the rule of law.

The challenge lies in striking a balance between the benefits of these digital technologies and their potential for harm. To safeguard democracy and the rule of law, it is imperative to develop robust mechanisms for fact-checking, promote digital literacy, and implement regulations that foster ethical and responsible uses for new technology. The impact of emerging technologies on democracy is an ongoing and evolving conversation, one that demands our continuous attention and concerted efforts to ensure that they ultimately work in favor of democratic values and institutions.

Technodiversity should also be perceived as a cornerstone for this endeavor. It is paradoxical to fight for democracy on platforms not built to facilitate it, without realizing that the path towards democratic resilience involves reimagining and redesigning the technology we currently rely on. The challenges imposed by digital technologies to our habitual practice of democracy invite us to return to the concept of democracy and to reflect on its radicality. Democratic practice depends on its medium, while democracy as a concept also resists the determination of its medium. The discussion on democracy will be futile without taking up the agenda of technodiversity. Oftentimes, we have fallen prey to what Yuk Hui calls a monotechnological culture, in which we naively accept the industrial technology as the inevitable and universal force, and consequently surrender to a diversity-weakening force that leads to the synchronization of our shared human experiences in the new digital frontier[17].

By putting the prevailing universalist approach to technology into question, we can turn to explore how different cosmotechnics may lead to different paths and, therefore, solutions to our current impasse. Debating ways to make dominant social media platforms more “democratic”, for example, is necessary but not sufficient because as citizens become mere consumers of technology, “they have

17. HUI, Yuk. ***Tecnodiversidade***. São Paulo: Ubu Editora, 2020, pp. 89-96.

to adapt to new interfaces and new algorithms over which they have no control or influence"[18]. Instead of focusing on property itself, as the free software movement would insist, we should focus on the epistemological ground on which these technologies are built. Or, as Hui argues, we should focus on both the democratic construction of technologies and the construction of democratic technologies[19].

Every technology carries specific epistemological assumptions that are overshadowed by the common (and misleading) perception that it is universal. When traveling down the path prescribed by technodiversity, consequently, one is invited to consider how other forms of knowledge – including indigenous or non-modern knowledge – can be fed into the development and application of new digital technologies. This includes the inner-workings of dominant social media platforms, which base their operations on specific assumptions of how social interactions work and, therefore, how a digital community should be structured. This often entails a focus on the individual, which is seen as the fundamental building block of a social network. However, as Hui demonstrates, we can also envision "a social network based on collectives rather than individuals, and this might serve as an example of how to implement technodiversity"[20].

The universalist approach creates an imaginary (albeit consequential) cage around technology-oriented debates in the field of democracy and democratic institutions alike. If the dominant design of social media platforms or AI is not working in favor of democracy, then we are doomed to try and fix it under the current paradigm or live with the consequences of our failure. Technodiversity, instead, invites us to conceive alternative futures based on different epistemological foundations. Social media platforms and AI are not universal. They can (and must) be reconceptualized when necessary, working in tandem with the concept of noodiversity.

Conclusion: Paving the Way Towards an Alliance

When we concentrate all our efforts and attention on regulating new technologies without duly considering technodiversity, the universal approach described above becomes a dangerous self-fulfilling prophecy. The current global competition hinged on such a conception of technology is not only dangerous but also disastrous. The time has come to interrupt this cycle and invite stakeholders and policymakers to reconsider the assumptions on which current discussions

18. HUI, Yuk. **Democracy and Technodiversity**. Unpublished manuscript, 2023, p. 05.
19. *Ibidem*, p. 05.
20. *Ibidem*, p. 08.

are grounded. This is even more urgent now when policy debates are picking up speed and an intricate web of regulations is emerging on the national, international, and transnational levels. The philosophy of technodiversity offers us invaluable insights that can be adapted into a roadmap for fostering a global alliance committed to reframing policy-oriented debates in the 21st century.

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iii) Clarifying issues regarding emerging technologies – promises and threats – to policy makers, experts, activists and the public in general at a national, regional and international level.

iv) Mobilizing progressive forces to capture value or oppose threats, and design collaborations between competing interests for the public good; and,

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