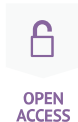




SPECIAL
ISSUE



OPEN
ACCESS

Introduction to the special issue on governing the metaverse through the lens of the public sphere

Annelieke Mooij *Tilburg University*

Sunimal Mendis *Tilburg University*

DOI: <https://doi.org/10.14763/2026.3.2117>

Published: 24 September 2026

Received: 27 August 2026 **Accepted:** 14 September 2026

Funding: This publication is part of the Tilburg University research DIGI-APPS, led by principal investigators Annelieke A.M. Mooij and Sunimal Mendis, which was funded by a Starter Grant, awarded under the Coalition Agreement 2022 for Higher Education and Science.

Competing Interests: The author has declared that no competing interests exist that have influenced the text.

Licence: This is an open-access article distributed under the terms of the Creative Commons Attribution 3.0 License (Germany) which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. <https://creativecommons.org/licenses/by/3.0/de/deed.en>
Copyright remains with the author(s).

Citation: Mooij, A., & Mendis, S. (2026). Introduction to the special issue on governing the metaverse through the lens of the public sphere. *Internet Policy Review*, 15(3). <https://doi.org/10.14763/2026.3.2117>

Keywords: Metaverse, Virtual worlds, Virtual reality, Digital public sphere, Platform governance

Abstract: The evolution and proliferation of virtual worlds – referred to under the umbrella term ‘metaverse’ – has given rise to an additional virtual public sphere offering the public enhanced possibilities for public interaction via immersive forms of multi-modal communication. In doing so, the metaverse poses a disruptive technological innovation that can radically reshape how people encounter and communicate with one another, how power is exercised and, ultimately, how rights are enjoyed and protected. The metaverse as a new virtual public sphere poses an urgent challenge to existing governance frameworks in the EU. This editorial advocates a three-dimensional approach centered around three interconnected questions: what aspects of public life are moving into virtual environments, who controls the infrastructures through which that movement occurs, and who can legitimately determine the rules under which life in those environments is conducted. It underscores the need for a comprehensive, functional approach to governance to accurately identify what conditions must be fulfilled for the metaverse to develop as a robust virtual public sphere that safeguards democracy and the rule of law.

Why the metaverse can change our physical world for good and for bad

The challenge of governing the metaverse begins with a deceptively simple question: what exactly is being governed? Platforms such as Roblox and Fortnite, gaming platforms that enable engaging with and creating content, are frequently used as examples of metaverse-like environments (Clough & Wu, 2024), yet there is still no generally accepted definition of the metaverse itself (Hadi et al., 2024) and 'metaverse' remains a polysemic term that is understood and interpreted in different ways, in different contexts (Dwivedi et al., 2022). While in common parlance the term 'metaverse' is often used to refer to the virtual reality platform operated by the company Meta Platforms, it must be underscored that it is a term that has a much broader application. At its broadest, the concept describes a network of immersive digital spaces in which users can interact and, potentially, move between different virtual environments (Ball, 2022). These spaces may accommodate a wide range of activities from remote work and commercial exchange to concerts, social gatherings, and political participation. The significance of the metaverse therefore lies less in the existence of virtual worlds as such, its disruptiveness is the possibility that these worlds may become (seamlessly) connected spaces in which an increasing share of social, economic, and democratic life takes place across geographical boundaries. It thereby represents the next iteration of the Habermasian vision of the public sphere (Habermas, 1989); offering individuals and groups a virtual online space to engage in varied forms of social, cultural, political, and economic interactions.

The public sphere in this contribution is defined as platforms where users can interact without the need to be approved for individual entrance to the platform through human discretion. This definition is based upon preamble Article 14 of the European Union's Digital Services Act (2022) which defines public information as accessible without the need for human decision. As exemplified below, in comparison with the traditional public sphere (comprising physical public spaces and legacy media) and the non-immersive digital public sphere (e.g., social media platforms such as Facebook, YouTube, Instagram), this virtual public sphere offers possibilities for multi-modal and interactive communication that integrates three-dimensional objects and introduces a new level of realism both on account of graphics and by incorporating new hardware such as haptic suits and virtual headsets. The Travis Scott concert in metaverse's Fortnite drew 12 million people from across the globe without the need for any of the attendants to leave their living room (BBC News, 2020). The avatars of users can vary from make-belief characters

to life-like digital simulations. These digital simulations can create a strong sense of embodiment and identification between users and their avatars. In some virtual settings, events affecting an avatar's virtual body can elicit corresponding bodily sensations or even experiences of pain in the user (Romano, Llobera, & Blanke, 2016). It also gives rise to new forms of commerce (e.g., blockchain based smart-contracts) and virtual assets (e.g., virtual land, NFT-backed virtual goods) that challenge traditional notions of property and contractual relations.

Activities historically tied to physical space are increasingly capable of taking place in virtual ones (Zhang et al., 2022; Sabatucci et al., 2023). There are some who argue that the virtual is (largely) regulated by the legislation governing the same physical activities (Auer & Manne, 2023). But transferring an activity from a physical setting to a virtual environment does not simply reproduce the same activity in virtual form. The conditions of participation change: how people encounter one another, how they communicate with each other, how power is exercised and, ultimately, how rights are enjoyed and protected. The challenge is that the spaces in which this all occurs are neither neutral nor independent. Virtual environments rely on platforms and infrastructures that are frequently privately owned while operating across territorial jurisdictions (de Zwart & Lindsay, 2009).

Thus, the metaverse poses a disruptive technology that can radically reshape our notions of self and community and challenge our current divisions of the public and private spheres. In doing so, it reshapes how fundamental rights are defined, protected, and exercised, as well as the mechanisms through which democracy and the rule of law are upheld in the public sphere. Thus, it is timely to investigate how the advent of the metaverse can create tensions in existing governance frameworks and how these frameworks could be re-imagined and adapted to address the emerging reality of a virtual public sphere. The EU Commission's (2023) Web 4.0 initiative aims at developing and governing the metaverse based on four key strategic pillars: empowering people, businesses, governments, and shaping global standards for open and interoperable virtual worlds. The EU Parliament's (2024) resolution on virtual worlds highlights specific governance-related concerns posed by the advent of virtual worlds.

This special issue contributes to this current policy discourse by engaging in a multi-disciplinary and multi-faceted investigation to identify specific aspects of the current governance framework that need to be re-examined and to formulate viable proposals for rendering them relevant and effective to the age of the metaverse. There are thus many governance and regulatory questions for legislators that arise with the introduction of the metaverse (Silva, Vaz, & Freitas, 2023). Re-

searching each approach individually risks losing oversight. Approaching the metaverse through the lens of the public sphere, however, brings the governance and regulatory implications of this development into sharper focus. The contributions to this special issue approach different dimensions of this transformation. Taken together, they point towards three interconnected questions: *What moves into the metaverse? Who controls the environment into which it moves? And who can legitimately govern that environment?*

What moves into the metaverse?

Social life provides perhaps the most immediate example of activities migrating from physical into virtual environments. Shahin, Dutta, & Schabio (forthcoming) explore this development through user reactions to the metaverse. The paper opens with the example of an elaborate virtual wedding held during COVID-19. The example is revealing precisely because a wedding is ordinarily associated with physical presence: people gathering, sharing a space, and participating in a collective social experience. A virtual wedding loosens that connection between participation and geographical location. People who might otherwise be unable to attend can participate without being physically present. It furthermore provided a possibility for gathering in large crowds during pandemic lockdown restrictions. Viewed in this way, the virtual wedding is more than a technological curiosity.

Virtual environments in metaverse offer us a glimpse of how immersive environments may reshape what it means to be socially present (Oh, Bailenson, & Welch, 2018). The concept of being socially present already has been slowly changing through online media. The COVID-19 pandemic created a surge in the quest for being digitally socially present through livestreams (Onderdijk et al., 2021). The livestreams did not bring what people felt needed, the social presence resulting in a feeling of being connected (Kulla et al., 2024). It seems that metaverse does satisfy the social need of feeling connected (Hennig-Thurau et al., 2023). Unlike livestreams, VR environments offer that feeling of togetherness and social relaxation (Barreda-Ángeles & Hartmann, 2022). In educational VR-environments, this feeling was replicated and it led to more spontaneous interactions (Barreda-Ángeles, Horneber, & Hartmann, 2023). The downside of using such environments, however, cannot be forgotten. Taking the example of using metaverse for educational purposes offers clear upsides. Nevertheless, it also creates easy possibilities to gather private data of students. Eye-tracking, pupil data, and general posture can be used to 'measure' how actively students are participating and which are at risk of poor results (Dubovi, 2022; Halbig & Latoschik, 2021). This data can be de-

ployed to create early assistance for students but also risks algorithmic biases (Carter & Egliston, 2023) and raises ethical questions on student autonomy and privacy (Skulmowski, 2023). The metaverse thus creates opportunities, yet without a strong governance framework it also risks undermining individual autonomy.

Similarly, virtual environments can transform notions of self. A virtual avatar can become strongly intertwined with a person's sense of being. For instance, the intertwining of a person's sense of being with their avatar may be deployed to treat chronic pain relief through the virtual embodiment of patients (Matamala-Gomez et al., 2019). At the same time this raises new risks for privacy, accessibility, and long-term effects (Buragohain et al., 2025). A closer examination unearths even more subtle risks to users and their wellbeing. These subtler risks, however, may be more systemic in nature and can have significant disruptive consequences. One example is the experience of physical pain mediated through an avatar. When a person's avatar is attacked or assaulted by another avatar or is harmed as a result of a bug in the platform's system, the user may experience the resulting pain as if it were happening to their own body. That creates a strong need for a criminal code governing the metaverse. Creating such a code is not an easy task (Haber, 2024). If we distinguish between virtual and physical, then on what basis is harm defined? If there is no such distinction, are any types of violent games allowed in the metaverse?

Culture and heritage raise similar questions. The metaverse offers possibilities not only for creating new cultural artefacts but also for experiencing existing heritage in different ways. Museums, historical environments, and cultural objects can be recreated virtually and made accessible across geographical boundaries. It can potentially offer something resembling a *Night at the Museum* (movie from 2006) experience to anyone with a device and internet connection. Yet, as Bosch Navarro, Capellà i Ricart, & Chomczyk Penedo (forthcoming) demonstrate, digitising heritage does not eliminate the choices involved in curating it. Someone must still decide which histories are preserved, which stories are foregrounded and which are deleted. Even more important is their question of who is entitled to participate in those decisions. User-led moderation and participation may open the door to more democratic forms of cultural curation, but those possibilities coexist with the authority of platform owners to determine what may be created, accessed, altered, or removed.

The same tension between participation and control appears in copyright law. Existing research suggests that the emergence of the metaverse does not, in itself, require a fundamental restructuring of copyright law. Existing rules governing the

creation, ownership, and exercise of copyright are generally capable of extending to virtual environments, leaving platforms and users subject to established copyright and contractual principles (Mezei & Chawla Arora, 2024). Mendis (2026) continues their argument by examining whether the governance of copyright law is adept to virtual realities. Whereby it is questioned who should decide on what is copyright-protected and what adaptations are made to enable democratic speech. This question of who should decide: the users, the state through judges, or the platform, is a question leading back to a more fundamental question. It boils down to whether metaverse realities should be considered companies, states, or something in between? Whilst primary instincts may react that a company is never a state, companies with state powers are not unprecedented (Mooij & Tushuizen, 2024). Enforcing stronger duties upon such realities to safeguard democratic rights is arguably a natural consequence (Mooij & Tushuizen, 2024).

This problem of governance becomes more acute when virtual environments are used for explicitly political purposes. Social media has shown examples of how digital intervention campaigns have successfully disrupted democratic processes (Mooij, 2025; Matamoros-Fernández & Farkas, 2022; Saurwein & Spencer-Smith, 2020; Bennett & Livingston, 2018). Vică et al. (2026) consider the potential deployment of similar disruptive campaigns through virtual realities by using avatar(ro)bot accounts and indicate the dangers to the integrity of physical elections. Virtual identities can create additional avenues for political participation, but they can also become instruments through which participation is manipulated (Nikolaou, Schwabe, & Boomgaarden, 2022). Coordinated swarms of bots, for example, may be capable of influencing political discussion, intimidating voters or interfering with freedom of expression. The same characteristics that make virtual political spaces potentially more accessible can therefore make them vulnerable to new forms of interference.

Nor does the movement of democratic activity into virtual environments stop with political debate and elections. Flower and De Vocht (2026) examine whether criminal trials can be conducted fairly in the metaverse. Their contribution brings into view a particularly important feature of the transition from physical to virtual spaces: institutional practices depend on more than their formal procedures. A courtroom is more than the building. Removing the physical presence of parties may affect communication, human interaction, and perceptions of fairness, including whether participants experience voice, trust, neutrality, and respect. Yet immersive environments may also overcome some of the shortcomings associated with conventional video hearings (Rossner & Tait, 2021) by recreating elements of

spatial presence, eye contact, and more natural interaction. For some participants, virtual proceedings may even make engagement with the justice system more accessible or less intimidating. What starts with virtual criminal courts may create benefits for private, administrative, and constitutional law courts.

These examples point towards a common challenge. When an activity moves from physical to virtual space, the relevant question is not simply whether technology can reproduce it. The move changes the circumstances in which people exercise rights, encounter institutions, and participate in collective life. It may remove existing barriers for some of the participants while simultaneously creating new ones for the same or other participants. The metaverse can therefore expand the possibilities for participation without necessarily reproducing the safeguards that have historically accompanied participation in physical spaces.

The same dynamic extends to economic life. As virtual economies develop, work too may increasingly take place within immersive environments. Industries such as virtual tourism, teaching, and marketing are likely to expand with the growth of the metaverse (Dwivedi et al., 2022). The growth of such virtual industries brings opportunities for new types of remote working and ease by which workers switch jobs. Mamer and Freyberg-Inan (2026), however, identify a striking paradox in this development: workers may gain unprecedented mobility in virtual space while becoming less mobile in the physical world. More fundamentally, virtual work cannot be separated from the infrastructure through which it is performed. Where access to employment, markets, and digital assets depends upon privately governed platforms, shifting economic activity into the metaverse may not disperse power at all. Instead, it may deepen workers' dependence on the private actors controlling the environments in which virtual economic activity occurs.

Seen through the public sphere lens, the question of what moves into the metaverse concerns more than the transfer of activities from physical to virtual realities. It asks how social, cultural, political, judicial, and economic practices are transformed when they take place in immersive environments governed by different forms of technological, legal, and private authority. This brings us to the second question of who controls the environment into which these activities migrate.

Who controls the environment into which public life migrates?

The extent to which users can move between virtual environments depends heavily on interoperability. Without meaningful interoperability, the metaverse risks be-

coming little more than a collection of isolated “walled gardens”, each governed by its own technical architecture and commercial interests (Ball, 2022). This matters because participation itself involves investment. Users may spend considerable time and money developing their avatar (Hesselbein & Bory, 2025), thereby establishing a digital identity and perhaps digital reputation (good or bad), acquiring virtual assets and building social or professional relationships within a particular environment. If none of those investments can travel with them, moving to another platform effectively means starting anew. The resulting switching costs do more than inconvenience users: they reinforce vendor lock-in and strengthen the position of the platform controlling the environment in which those investments have accumulated (Trioux et al., 2026; Preda & Jovanova, 2013).

Interoperability can therefore be understood as a question of power as much as one of technical compatibility. If identities, assets, and forms of economic activity can move between virtual environments, users and businesses become less dependent on any single platform provider (Steed, 2024). Participation can extend across several environments rather than remaining enclosed within a proprietary ecosystem. Aguerre & Maquieira Alonzo (2026) nevertheless show why achieving this is far from straightforward. Their contribution points towards a possible middle ground between completely closed environments and an assumption of unrestricted interoperability, illustrating that interoperability itself involves choices about what should move between platforms, under what conditions, and according to whose standards.

Even extensive interoperability, however, would not eliminate private concentrations of power. Bay & Gray (2026) make this particularly clear by shifting attention away from the virtual environments that users see and towards the infrastructure that makes those environments possible. The metaverse is not simply a collection of virtual spaces. It rests on a technological stack extending from physical networks and cloud infrastructure through devices, operating systems, and applications to the immersive content encountered by users. Major technology companies are already positioned across several of these layers. As a result, existing forms of platform power may be reproduced – and potentially reinforced – as the Extended Reality (XR) economy develops (Gray & Bay, 2023).

This distinction matters for understanding the metaverse as a public sphere. A user may formally be free to move between virtual worlds, whilst still depending on infrastructure controlled by a small number of private actors (Yang et al., 2025). Interoperability at the level of individual platforms does not necessarily produce openness at the infrastructural level. A system of interconnected virtual environ-

ments could therefore remain highly concentrated even if no single virtual world operates as a completely closed ecosystem. Bay & Gray's call for a layered regulatory approach responds to precisely this problem: power must be identified across the technological stack rather than assumed to reside within a single platform or market (2026).

The question of control consequently extends well beyond ownership of particular virtual worlds. Platform operators may decide who can enter, what forms of expressions are permitted and under what economic conditions users participate. Infrastructure providers, meanwhile, can shape the technological possibilities available to those platforms in the first place. As social, cultural, political, and economic activities become increasingly dependent upon these environments, control over digital infrastructure becomes inseparable from control over the conditions under which participation occurs.

Considered in the context of the public sphere, the distribution of authority across states, platforms, infrastructures, and user communities shows that what moves into the metaverse is not only social, cultural, economic, and political activity. It also includes the institutions, rights, and forms of participation that structure those activities. As these practices further migrate into virtual environments, the conditions under which rights are exercised and democratic participation takes place are shaped by multiple centres of authority. The challenge is therefore to determine how these different forms of power should be allocated, constrained, and coordinated so that the movement of public life into the metaverse does not weaken the protections associated with it.

Who can legitimately govern the metaverse?

The transnational character of the metaverse makes conventional answers to this question increasingly difficult to sustain. Prakash G. & Rajan (2026) demonstrate the problem by examining the interaction between different legal regimes, with particular attention to the European Union (EU) and India. Rather than assuming that one regulatory model can simply be transposed to virtual environments everywhere, they identify the possibility of legal gaps arising from differences in regulatory priorities, infrastructure, and approaches to sovereignty. Their proposed hybrid model combines elements of the EU's proactive approach to legal compliance with India's particular infrastructural and sovereignty constraints in an attempt to develop a framework capable of protecting users' rights across these differences.

The coexistence of different legal regimes nevertheless exposes a deeper difficulty: authority over the metaverse cannot easily be located in a single place.

Balarabe (2026) addresses this problem through the concepts of digital sovereignty and polycentric governance. On this account, the state is only one of several centres from which authority is exercised. States regulate through law; platforms establish and enforce rules governing everyday interaction; protocol designers determine elements of what is technologically possible; and user communities generate their own norms, practices, and expectations.

Governance in the metaverse is therefore already distributed, whether or not the law formally recognises it as such. Balarabe's layered allocation-of-functions framework responds to this reality by recognising that no single actor exercises comprehensive authority over virtual spaces and highlighting the absence of a clear chain of command. He therefore offers a framework for studying the metaverse as a distributed space governed by shifting combinations of sovereignty. The relevant question becomes not which actor should govern the metaverse in its entirety, but how different forms of authority should be allocated, constrained, and coordinated.

Examined via the perspective of the public sphere, this distribution of authority is especially significant. Democratic and fundamental rights may originate in constitutions, legislation, and other forms of public law, but their practical exercise within the metaverse increasingly depends on privately designed platforms, technical protocols, infrastructural choices, and community norms. A formal legal right to speak, participate, or organise means relatively little if the architecture of the environment makes its exercise impossible. Nor are these rights fully guaranteed if a private platform can effectively determine its boundaries. Protecting the public sphere in the metaverse therefore requires more than resolving questions of territorial jurisdiction. It requires attention to how these overlapping centres of authority interact, how their power is constrained and whether the resulting governance arrangements are legitimate, accountable, and capable of protecting users' rights.

Finally, Engelbrecht's (2026) opinion piece explores how the semantic branding of virtual worlds as the metaverse in popular parlance has resulted in the current metaverse discourse being dominated by techno-centric scholarship emphasising its character as a technological infrastructure and thereby ignoring its nature as a social infrastructure for human interaction. Engelbrecht argues that this shift in epistemic authority has resulted in a "governance gap" whereby current governance strategies prioritise technological visions serving corporate interests over those of human users. This opinion piece raises yet another fundamental question

for governance: *“For whom is the Metaverse?”* With corporations exerting increased influence over the governance agenda (Egliston, Carter, & Clark, 2024), how can we ensure its preservation as an open and accessible public sphere that fosters meaningful social organisation and engagement? The contributions to this special issue consequently reveal that there is no single “legal problem” or “governance problem” of the metaverse. Social interaction, cultural participation, political debate, elections, justice, and work – each generate their own doctrinal and regulatory questions. What connects them is the transformation of the spaces in which these activities occur. Practices that historically depended upon physical environments may increasingly take place within digital spaces whose architecture, ownership, and geographical reach differ fundamentally from those of the physical world. Unlike previous virtual communities, the metaverse offers a global but privately owned platform infrastructure. And whilst it enables new senses of being together, it also offers the potential to harvest more data on the user than ever before.

For that reason, governing the metaverse cannot simply mean transferring the rules of the physical world into virtual space. Nor is it sufficient to treat the metaverse as another technological product to which another layer of technology regulation should be applied. The deeper challenge concerns the conditions of participation. If activities central to social, economic, and democratic life increasingly take place within immersive and transnational environments that are substantially privately governed, then protecting the public sphere requires asking not only which rights users formally possess, but whether the environments themselves allow those rights to be meaningfully exercised.

The task of governing the metaverse is therefore not simply to choose between embracing its possibilities and guarding against its risks. It is to determine the conditions under which those possibilities can develop, without allowing the infrastructures that enable participation to undermine the rights that participation is supposed to serve. If the metaverse is to become a meaningful extension of the public sphere, its governance must ultimately confront three inseparable questions: what aspects of public life are moving into virtual environments, who controls the infrastructures through which that movement occurs, and who can legitimately determine the rules by which life in those environments is conducted.

References

- Aguerre, C., & Maquieira Alonzo, J. (2026). Varieties of interoperability in the metaverse. *Internet Policy Review*, 15(3). <https://doi.org/10.14763/2026.3.2120>
- Auer, D., & Manne, G. A. (2023). *Regulating the metaverse: Putting the meta-cart before the meta-horse*. International Center for Law and Economics. <https://laweconcenter.org/resources/regulating-the-metaverse-putting-the-meta-cart-before-the-meta-horse/>
- Balarabe, K. (2026). Digital sovereignty and jurisdictional complexities in the metaverse: Rethinking legal authority in virtual spaces. *Internet Policy Review*, 15(3). <https://doi.org/10.14763/2026.3.2106>
- Ball, M. (2022). *The Metaverse*. Liveright Publishing Corporation.
- Barreda-Ángeles, M., & Hartmann, T. (2022). Psychological benefits of using social virtual reality platforms during the covid-19 pandemic: The role of social and spatial presence. *Computers in Human Behavior*, 127, 107047. <https://doi.org/10.1016/j.chb.2021.107047>
- Barreda-Ángeles, M., Horneber, S., & Hartmann, T. (2023). Easily applicable social virtual reality and social presence in online higher education during the covid-19 pandemic: A qualitative study. *Computers & Education: X Reality*, 2, 100024. <https://doi.org/10.1016/j.cexr.2023.100024>
- Bay, M., & Gray, J. E. (2026). Big tech trajectories: A layer-model approach to extensions of platform power in the emerging XR economy. *Internet Policy Review*, 15(3). <https://doi.org/10.14763/2026.2.2097>
- BBC News. (2020, April 24). Fortnite's Travis Scott virtual concert watched by millions. *BBC News*. <https://www.bbc.com/news/technology-52410647>
- Bennett, W. L., & Livingston, S. (2018). The disinformation order: Disruptive communication and the decline of democratic institutions. *European Journal of Communication*, 33(2), 122–139. <https://doi.org/10.1177/0267323118760317>
- Bosch Navarro, N., Capellà i Ricart, A., & Chomczyk Penedo, A. (forthcoming). Who is writing history? Content moderation and historical narratives in the virtual worlds. *Internet Policy Review*, 15(3). <https://doi.org/10.14763/2026.3.2121>
- Buragohain, D., Khichar, S., Deng, C., Meng, Y., & Chaudhary, S. (2025). Analyzing metaverse-based digital therapies, their effectiveness, and potential risks in mental healthcare. *Scientific Reports*, 15(1), 17066. <https://doi.org/10.1038/s41598-025-00916-4>
- Carter, M., & Egliston, B. (2023). What are the risks of virtual reality data? Learning analytics, algorithmic bias and a fantasy of perfect data. *New Media & Society*, 25(3), 485–504. <https://doi.org/10.1177/14614448211012794>
- Clough, D. R., & Wu, A. (2024). Metaverse Management as Urban Planning: Lessons from Paradise (Nevada). *California Management Review*, 66(4), 121–139. <https://doi.org/10.1177/00081256241247067>
- de Zwart, M., & Lindsay, D. (2009). Governance and the global metaverse. In D. Riha & A. Maj (Eds), *The real and the virtual: Critical issues in cybercultures* (pp. 171–182). BRILL. <https://doi.org/10.1163/9781848880122>
- Dubovi, I. (2022). Cognitive and emotional engagement while learning with VR: The perspective of

multimodal methodology. *Computers & Education*, 183, 104495. <https://doi.org/10.1016/j.compedu.2022.104495>

Dwivedi, Y. K., Hughes, L., Baabdullah, A. M., Ribeiro-Navarrete, S., Giannakis, M., Al-Debei, M. M., Dennehy, D., Metri, B., Buhalis, D., Cheung, C. M. K., Conboy, K., Doyle, R., Dubey, R., Dutot, V., Felix, R., Goyal, D. P., Gustafsson, A., Hinsch, C., Jebabli, I., ... Wamba, S. F. (2022). Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, 66, 102542. <https://doi.org/10.1016/j.ijinfomgt.2022.102542>

Egliston, B., Carter, M., & Clark, K. E. (2025). Who will govern the metaverse? Examining governance initiatives for extended reality (XR) technologies. *New Media & Society*, 27(6), 3361–3381. <https://doi.org/10.1177/14614448231226172>

Engelbrecht, C. H. (2026). The governance gap: Why ignoring virtual world scholarship imperils metaverse policy. *Internet Policy Review*, 15(3). <https://policyreview.info/articles/news/ignoring-virtual-world-scholarship/2098>

European Commission. (2023). *An EU initiative on Web 4.0 and virtual worlds: A head start in the next technological transition* (Communication COM(2023) 442 final). <https://digital-strategy.ec.europa.eu/en/library/eu-initiative-virtual-worlds-head-start-next-technological-transition>

European Parliament. (2024). *European Parliament resolution of 17 January 2024 on virtual worlds – opportunities, risks and policy implications for the single market (2022/2198(INI))* (C/2024/5723). <https://eur-lex.europa.eu/eli/C/2024/5723/oj/eng>

European Parliament and Council. (2022). *Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a single market for digital services (Digital Services Act)* (No. 2022/2065). European Parliament and Council. <https://eur-lex.europa.eu/eli/reg/2022/2065/oj/eng>

Flower, L., & de Vocht, D. (2026). Is a fair trial possible in the metaverse? A procedural justice and sociological perspective in conversation. *Internet Policy Review*, 15(3). <https://doi.org/10.14763/2026.3.2107>

Gray, J. E., & Bay, M. (2023). Platform power, XR, and the metaverse: New challenges or old structures? *AoIR Selected Papers of Internet Research*. <https://doi.org/10.5210/spir.v2023i0.13424>

Haber, E. (2024). The criminal metaverse. *Indiana Law Journal*, 99(3). <https://www.repository.law.indiana.edu/ilj/vol99/iss3/4>

Habermas, J. (1989). *The structural transformation of the public sphere: An enquiry into a category of bourgeois society*. MIT. <https://www.bibguru.com/b/how-to-cite-the-structural-transformation-of-the-public-sphere/>

Hadi, R., Melumad, S., & Park, E. S. (2024). The Metaverse: A new digital frontier for consumer behavior. *Journal of Consumer Psychology*, 34(1), 142–166. <https://doi.org/10.1002/jcpy.1356>

Halbig, A., & Latoschik, M. E. (2021). A systematic review of physiological measurements, factors, methods, and applications in virtual reality. *Frontiers in Virtual Reality*, 2, 694567. <https://doi.org/10.3389/frvir.2021.694567>

Hennig-Thurau, T., Aliman, D. N., Herting, A. M., Cziehso, G. P., Linder, M., & Kübler, R. V. (2023). Social interactions in the metaverse: Framework, initial evidence, and research roadmap. *Journal of the Academy of Marketing Science*, 51(4), 889–913. <https://doi.org/10.1007/s11747-022-00908-0>

Hesselbein, C., & Bory, P. (2025). Metaverse bodies. In C. Hesselbein & P. Bory, *Infrastructures of*

reality: *Metaverse stories, spaces, bodies* (pp. 75–105). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-97167-9_4

Kulla, S. T., Sungur, H., & Sumter, S. R. (2024). The role of social presence in live and recorded concert viewing: Effects on enjoyment and emotional well-being. *Computers in Human Behavior Reports*, 14, 100409. <https://doi.org/10.1016/j.chbr.2024.100409>

Mamer, T., & Freyberg-Inan, A. (2026). Superhighway to serfdom: The political economy of the metaverse. *Internet Policy Review*, 15(3). <https://doi.org/10.14763/2026.3.2113>

Matamala-Gomez, M., Donegan, T., Bottiroli, S., Sandrini, G., Sanchez-Vives, M. V., & Tassorelli, C. (2019). Immersive virtual reality and virtual embodiment for pain relief. *Frontiers in Human Neuroscience*, 13, 279. <https://doi.org/10.3389/fnhum.2019.00279>

Matamoros-Fernández, A., & Farkas, J. (2021). Racism, hate speech, and social media: A systematic review and critique. *Television & New Media*, 22(2), 205–224. <https://doi.org/10.1177/1527476420982230>

Mendis, S. (2026). Copyright and democratic discourse in virtual public spaces: Challenges for EU platform governance. *Internet Policy Review*, 15(3). <https://doi.org/10.14763/2026.3.2109>

Mezei, P., & Chawla Arora, G. (2024). Copyright and metaverse. In L. A. DiMatteo & M. Cannarsa (Eds), *Research Handbook on the Metaverse and Law* (pp. 190–206). Edward Elgar Publishing. <https://doi.org/10.4337/9781035324866.00019>

Mooij, A. (2025). *Synthetic manipulation and electoral integrity: Deepfakes, bots, and the limits of the EU's democratic defense package*. <https://doi.org/10.2139/ssrn.5825006>

Mooij, A., & Tushuizen, J. (2024). Regulating the virtual world as a new state. *European Law Blog*. <https://doi.org/10.21428/9885764c.f73894de>

Nikolaou, A., Schwabe, A., & Boomgaarden, H. (2022). Changing social attitudes with virtual reality: A systematic review and meta-analysis. *Annals of the International Communication Association*, 46(1), 30–61. <https://doi.org/10.1080/23808985.2022.2064324>

Oh, C. S., Bailenson, J. N., & Welch, G. F. (2018). A systematic review of social presence: Definition, antecedents, and implications. *Frontiers in Robotics and AI*, 5, 114. <https://doi.org/10.3389/frobt.2018.00114>

Onderdijk, K. E., Swarbrick, D., Van Kerrebroeck, B., Mantei, M., Vuoskoski, J. K., Maes, P.-J., & Leman, M. (2021). Livestream experiments: The role of COVID-19, agency, presence, and social context in facilitating social connectedness. *Frontiers in Psychology*, 12, 647929. <https://doi.org/10.3389/fpsyg.2021.647929>

Prakash G., A., & Rajan, Y. (2026). Navigating legal complexities of metaverse interoperability: A comparative study of governance models of EU and India. *Internet Policy Review*, 15(3). <https://doi.org/10.14763/2026.3.2110>

Preda, M., & Jovanova, B. (2013). Avatar interoperability and control in virtual worlds. *Signal Processing: Image Communication*, 28(2), 168–180. <https://doi.org/10.1016/j.image.2012.10.012>

Romano, D., Llobera, J., & Blanke, O. (2016). Size and viewpoint of an embodied virtual body affect the processing of painful stimuli. *The Journal of Pain*, 17(3), 350–358. <https://doi.org/10.1016/j.jpain.2015.11.005>

Rossner, M., & Tait, D. (2023). Presence and participation in a virtual court. *Criminology & Criminal*

Justice, 23(1), 135–157. <https://doi.org/10.1177/17488958211017372>

Sabatucci, L., Augello, A., Caggianese, G., & Gallo, L. (2023). Envisioning digital practices in the metaverse: A methodological perspective. *Future Internet*, 15(12), 394. <https://doi.org/10.3390/fi15120394>

Saurwein, F., & Spencer-Smith, C. (2020). Combating disinformation on social media: Multilevel governance and distributed accountability in Europe. *Digital Journalism*, 8(6), 820–841. <https://doi.org/10.1080/21670811.2020.1765401>

Shahin, S., Dutta, S., & Schabio, N. (forthcoming). Metaverse as a sociotechnical imaginary: A participatory approach to regulating virtual worlds. *Internet Policy Review*, 15(3). <https://doi.org/10.14763/2026.3.2122>

Silva, E. C. D. M., Vaz, J. C., & Freitas, A. R. D. (2023). Metaverse as dispute: Challenges for a state action agenda. *Proceedings of the 16th International Conference on Theory and Practice of Electronic Governance*, 9–15. <https://doi.org/10.1145/3614321.3614323>

Skulmowski, A. (2023). Ethical issues of educational virtual reality. *Computers & Education: X Reality*, 2, 100023. <https://doi.org/10.1016/j.cexr.2023.100023>

Steed, A. (2024). Three technical challenges of scaling from social virtual reality to metaverse(s): Interoperability, awareness and accessibility. *Frontiers in Virtual Reality*, 5, 1432907. <https://doi.org/10.3389/frvir.2024.1432907>

Trioux, A., Zhang, W., Valenzise, G., & Yang, F. (2026). Avatar standardization efforts for interoperable metaverse services: Toward a seamless avatar-as-a-service ecosystem. *IEEE Transactions on Services Computing*, 19(3), 1844–1861. <https://doi.org/10.1109/TSC.2026.3668856>

Vică, C., Uszkai, R., Dancu, A., & Voinea, C. (2026). Avatarbots and the crisis of democracy: From bot armies to metaverse swarms. *Internet Policy Review*, 15(3). <https://doi.org/10.14763/2026.3.2118>

Yang, L., Ni, S.-T., Wang, Y., Yu, A., Lee, J.-A., & Hui, P. (2025). Interoperability of the metaverse: A digital ecosystem perspective review. *IEEE Engineering Management Review*, 53(3), 29–54. <https://doi.org/10.1109/EMR.2025.3564923>

Zhang, Y., Li, Y., Zhang, E., & Long, Y. (2022). Revealing virtual visiting preference: Differentiating virtual and physical space with massive TikTok records in Beijing. *Cities*, 130, 103983. <https://doi.org/10.1016/j.cities.2022.103983>

Published by



ALEXANDER VON HUMBOLDT
INSTITUTE FOR INTERNET
AND SOCIETY



RESEARCH
FOR THE
DIGITAL AGE

in cooperation with



CREATE



centre
— internet
et societe



R&I
IN3
Internet
interdisciplinary
Institute
Universitat Oberta de Catalunya



UNIVERSITY OF TARTU
Johan Skytte Institute of
Political Studies