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# EDITORIAL DO COMICS HAVE ELECTRIC DREAMS? COMICS AND TECHNOLOGY

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There should be no doubt that life today is dominated by the computational, the digital, and the technological. While not synonymous—and despite the long history of contradictory definitions of each term—together they contribute to a complicated, enmeshed network of relationships between the human and the machinic, the natural and the artificial, often revealing how much one depends on the other. These 'techniques' (in a poor attempt to use one word that could cover such distinct realities) develop, extend, and communicate human endeavours, and sometimes they can also alter, hinder or problematise them. These issues become particularly acute in comics, a form (not a *medium* and definitely not a 'genre') whose production and circulation have long been shaped by technological infrastructures.

In such a fast-paced and shifting landscape, the boundaries of agency and perception become increasingly porous, inviting us to reconsider where cognition resides and how it circulates through human bodies, technical systems, and the hybrid spaces between them. The more technologies insinuate themselves into everyday creative and communicative practices, the more urgent it becomes to understand them not as external tools but as co-participants in meaningmaking.

Katherine Hayles considers cognition as "the result of embodied processes emerging from an organism's embeddedness within an environment" (2017, p. 24), upon which Per Israelson comments that "[a]s technical environments, machines are processes of nonconscious cognition … aware of their environments without being aware." (2026, p. 609).

Such formulations challenge the assumption that cognition is an exclusively human prerogative. They suggest instead a continuum of cognitive operations—some conscious, some not—that unfold across biological and technical substrates alike. When machines participate in these processes, they do so not by replicating human thought but by contributing their own forms of patterned responsiveness, shaping the conditions under which cultural artefacts—including comics—are produced and experienced, showing how labour is also reorganised within the same human-machine cognitive infrastructures.

Fears of a technological takeover of humanity are quite old and must be seen historically. As Aristotle stated in his *Politics*, "[i]f, in like manner, the shuttle would weave and the plectrum touch the lyre without a hand to guide them, chief workmen would not want servants, nor masters slaves" (1997, p. 7). Job displacement, labour value reduction, the erasure of collectivist principles and efforts, the perpetuation, amplification and even reification of biases via AI training data are the nightmarish fodder of such concerns, legitimate and warranted, and they have been thematised in both political strife—think of the Luddites— and fiction, across time and media—throughout the 19th century up to today.

This redistribution of labour is inseparable from social mechanisms and economies. Foucault's and Deleuze-Guattari's 'societies of control' no longer exert their surveillance powers as a one-point system in a closed space but open them up into a multiparty, decentralised system of tracking, data collection, and modulation of individuals (through algorithms, GPS, social media, credit scores, the so-called 'dynamic pricing', and so on), and often with voluntary participation by the 'data subjects'. Such recurring anxieties and consequent criticism should be directed toward the baseline profit-driven technological capitalist system that deploys and develops such apparatuses with a baked-in logic of power imbalance and dispossession (Mondzain, 2026), unaligned with 'human values', ethics or governance (Bostrom, 2014).

However, and to help us understand how contemporary comics production is reorganised under platform capitalism logics, we would like to quote Matteo Pasquinelli at length, from his masterful historical-analytical book *The Eye of the Master*,

showing us how changes are sometimes operated at slightly different levels:

The debate on the fear that AI fully replaces jobs is misguided: in the so-called platform economy, in reality, algorithms replace management and multiply precarious jobs. Although the revenues of the gig economy remain minoritarian in relation to traditional local sectors, by using the same infrastructure worldwide these platforms have established monopoly positions. In conclusion, the power of the new 'master' is not about the automation of individual tasks but the management of the social division of labour. Against Alan Turing's prediction, it was the master, not the worker, that the robot came to replace (2023, p. 250–251).

Comics (a term that here comprises graphic novels, comic books, manga, webtoons, newspaper strips, etc.), as cultural production, are not external to these dynamics. Comics Studies are no longer a burgeoning area of academic and intellectual inquiry. They are well-established, with decades-long interdisciplinary production, increasingly internationalised, with a vivid dialogue across multiple traditions, languages and particular histories of art and thought. More recently, a plethora of calls, conferences and editorial projects have focused on the relationship between new technologies and comics. Especially on how this relationship has shaped comics' very own conditions of possibility, expounding the way comics constitute themselves as a system with its own technological environment. As artist-researcher Ilan Manouach has observed, comics can be considered as Timothy Morton's "hyperobjects", i.e., "inter-objective systems, formed through the relations between multiple objects, eliding simple and detached descriptions" (2022, p. 19).

After all, comics are always already situated in a dense information economy and each step in the artistic process is technologically mediated and heavily coded: from the industrial adoption of the patented Ben Day photoengraving technique as a *conversion* tool for color separation in printing technologies and the *optimal* allocation of space for cartoons and daily strips in early newspapers, to the industry's complex *logistics* funnelled through global distribution sinews, transatlantic containers, warehouses and data centers, comics can be described as *technical/computational* objects (Manouach, 2022, p. 14).

The present issue of the *International Journal of Film and Media Arts* (*IJFMA*) argues that comics have always been entangled with technological systems; in fact, they can be described as a technologically determined art (through engraving, print, reproduction, and other media). The introduction of digital tools into comics-making processes can be traced back to Mike Saenz' mid-1980s work, for instance, and there were immediate, early platformisation endeavours as soon as the World Wide Web became largely available in the early 1990s. Contemporary digitally enhanced techniques and AIdriven transformations and adoptions are best understood as *intensifications*—not *ruptures*—of this long coevolution.

Moreover, comics will continue to evolve through mutating hybridities. In an age of increasingly screenoriented production and delivery of visual narratives, the entanglement between comics and technology becomes ever more apparent: not merely a matter of tools, but a dynamic process in which each reshapes the other, as much consequential to production pipelines as to ethical dimensions. This issue brings together perspectives that illuminate how comics and technological systems are coconstitutive, crossfertilising one another across creative, industrial, and experiential dimensions. It is within this complex interplay of cognition, labour, and technological mediation that the contributions to this issue situate themselves, examining how comics both reflect and reshape the technological conditions of their time.

We open the issue with an exceptional and broad-view article, built upon a remarkable theoretical interdisciplinary

scaffolding. "*A comic is a comic is a comic:* exploring prototypes, parameters, and (post)digital comics", by Giorgio Busi Rizzi, examines borderline issues of *comicsness*. As we embrace the digital in its many iterations, this article reveals, as mentioned above, that there is less of a *rupture* than an *expanding* of the field. While dialoguing with the eternally dissatisfying issue of definitionality, this young yet already established researcher in the crossroads of Comics Studies and digital affordances proposes a theory-based parameter to inquire about what makes a 'digital comic' a comic and a typology that may help us map and navigate the many-fold ways such territory can be explored, analytically and from a production point of view. While all typologies are made to be critically assessed and reworked further, Rizzi not only shows a way out of the 'essentialism' vs. 'historicism' debate as it also provides tools for future research. This is a powerful invitation to engage in further comparative analysis. Rizzi is also the author of an important article entitled "*Do AIs dream of electric comics?* Generative AI Models, Digital Memory, and Creativity" (2023) which had some influence in our own choice for this issue's specific title, harking back to the recurrent metaphor born in Philip K. Dick's famous novel.

We are also very proud and honoured to include an article by digital/hypercomics pioneer Daniel Merlin Goodbrey, who, along with his colleague David John Tree, contributes with "Three-dimensional Panel Arrangements in Augmented, Virtual and Mixed Reality Comics", offering a practicebased investigation into how comics can be reimagined for AR, VR, and MR environments. Drawing on Goodbrey's earlier theoretical model of seven key characteristics of comics, as well as scholarship on digital mediation, architectural comics, and narrative space in videogames, the authors present a series of experimental prototypes developed in two research phases. Their analysis shows how threedimensional panel arrangements can generate new narrative effects through spatial positioning, depth, and reader orientation, while also introducing significant navigational and ergonomic challenges—particularly when immersive movement disrupts established reading rhythms or produces reader fatigue. The article contrasts more sculptural, movementbased approaches with 'panel delivery' and threedimensional 'infinite canvas' models that keep the reader stationary, proposing these as more sustainable for extended narratives. Ultimately, the authors aim to balance the expressive potential of 3D spatiality with a smooth, legible reading experience in future mixedreality comics.

The article "A Multimodal Framework for Automated Background Music Generation in Japanese Manga Using Large Language Models", by Megha Sharma, Muhammad Taimoor Haseeb, Gus Xia, and Yoshimasa Tsuruoka examines the diverse ways of combining music and comics while proposing an AIassisted system that generates background music for manga through a multimodal machinelearning pipeline. What's fascinating about this study is that it goes well beyond describing a novel technical solution; in our view, it marks an important step in analysing what it calls 'musiccomics' as a multidisciplinary object: it combines perceptual research, narrative theory, and experimental modelling to test how empathetic, nondiegetic music might reshape the reading experience. Moreover, the authors remain attentive to the ethical stakes of automation—especially labour precarity and creative agency—positioning their framework not as a replacement for human musicians but as a carefully monitored, interventionfriendly tool whose adoption requires critical scrutiny.

Erik Barkman's contribution, "The Artificial Cartoonist: Key Characteristics of AI-assisted Sequential Storytelling", offers a sharply focused and exemplary close analysis. Barkman pens a comparative study between an AIgenerated comic with a wholly humanmade one (while carefully problematising these terms), situating both within the broader landscape of AIassisted comics production. Drawing on Jean Braithwaite and Kai Mikkonen's concept of 'figural solidarity',

he examines how AIgenerated narratives often struggle with visual coherence—character design, linework, panel composition, and expressive clarity—revealing structural tendencies that stem from the limitations of current image generators. Attentive to the rapid evolution of these technologies, Barkman's study invites us to consider not only the ethical dimensions of AIassisted creation but also how such tools reshape meaningmaking and the reader's experience.

Christopher Lambert's "From Panel to Pulse: Rethinking Comics Through Sound Technology", which closes our collection, examines how audible sound reshapes a medium traditionally defined by visualised and imagined aurality. Starting from the semiotic and cognitive foundations of 'imagined sound' and closure, Lambert analyses how sound technologies—from motion comics and Webtoons to AR/VR formats, external soundtracks, and fully sonic 'audiocomics'—intervene in the temporal and interpretive freedoms that underpin comics reading. Drawing on theorists such as McCloud, Peeters, Groensteen, Cohn, and Hague, he shows how the introduction of real sound creates an intermedial assemblage in which the linear temporality of audio collides with the spatial, readercontrolled temporality of comics. Lambert distinguishes between sound *in* and *with* comics and sound *as* comic, arguing that aurality must complement rather than override visual rhythm and reader agency. He concludes by proposing speculative applications of voicecloning and multimodal AI for accessible, immersive sonic remediation, while insisting that sound must *enhance*—rather than *destabilise*—the core affordances of the comics form.

We hope that this small, yet exciting collection of texts shows not only the vitality and urgency of rethinking comics through the lens of technological mediation but also opens new modes of inquiry. As traditional creation and production forms are changed by new technological affordances, the relationships between art and the digital must be reframed not as destructive or undermining forces, but as opportunities to redefine and rethink ontological, formal, and social expectations.

Before finishing, we also want to extend our acknowledgments. First and foremost, many thanks to CICANT in accepting our challenge for this thematic issue, especially Manuel José Damásio, as well as Anna Coutinho and Anastasiya Maksymchuk for their diligent and enduring editorial support. Very rarely are academic journals open to integrate comics as a worthwhile area of inquiry in Portugal, and we are grateful for this opportunity. We also thank everyone who contributed to this issue, not only the authors, but also the reviewers, for their time, collegiality, and patience. A special thanks to comics artist André Pereira for permitting us to use his art (from *The End of Madoka Machina*, 2023) on both the CfP and the cover of this *IJFMA* issue.

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