

History and artificial intelligence: methodology, semantics of machines and decolonial attitude

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Abstract

This article analyzes some of the transformations in historiography in the face of artificial intelligence and the digital society. Initially, it discusses the possible reconfiguration of historical consciousness and the methodological challenges posed by the advent of digital technologies, questioning whether the historicity of machines can be equated to a certain extent with human experience. Next, the semantics of machines is explored through the metaphor of the “cast away” (used by Rodrigo Bonaldo), which illustrates the ongoing fallibility involved in the work of historians, programmers, and those who delve into the digital. Finally, the article addresses decoloniality and ethics in digital society, criticizing Eurocentric models in history writing and algorithmic design. It also advocates the inclusion of decolonial perspectives for critical historiography. Thus, the study invites reflection on how new technologies can reconfigure the understanding of time, memory, and decoloniality in the historical discipline.

Keywords: digital history; artificial intelligence; semantics of machines; decoloniality; digital ethics.

História e inteligência artificial: metodologia, semântica das máquinas e atitude decolonial

Resumo

Este artigo analisa parte das transformações da historiografia diante da inteligência artificial e da sociedade digital. Inicialmente, discute-se a possível reconfiguração da consciência histórica e os desafios metodológicos impostos pelo advento das tecnologias digitais, questionando se a historicidade das máquinas pode equiparar-se em certa medida à experiência humana. Em seguida, explora-se a semântica das máquinas por meio da metáfora do “náufrago” (empregada por Rodrigo Bonaldo), que ilustra a constante falibilidade implicada no trabalho de historiadores programadores e daqueles que incursionam pelo digital. Por fim, o artigo aborda a decolonialidade e a ética na sociedade digital, criticando os modelos eurocêntricos presentes na escrita da história e na programação algorítmica. Defende, ainda, a integração de perspectivas decoloniais para uma historiografia crítica. O estudo, assim, convida a uma reflexão sobre como as novas tecnologias podem reconfigurar o entendimento do tempo, da memória e da decolonialidade na disciplina histórica.

Palavras-chave: história digital; inteligência artificial; semântica das máquinas; decolonialidade; ética digital.

¹ Most of this article is inspired by the written exam successfully completed in the first phase of the public competition held by the History Department of the University of São Paulo (USP), in the area of Teaching and Research Methodology in History. Some mentions or literal quotations from authors have been added, as well as the respective bibliographical references. Deletions, textual additions, and adjustments have also been made.

Introduction

In the past, within the Annales School, it was said that the historian of the future would either be a programmer or would not exist at all (Ladurie, 1973, p. 13–14). This passage has been recalled several times by Brazilian historians, especially by Maynard (2016). It was another moment in the history of historiography, another methodological condition, and other cultural parameters that gradually integrated the intellectual life of serialist professionals.

Currently, there nothing remains 'serial' in that sense, and the algorithmic temporalization of the present seems to have acquired a latent status in disciplinary practice. The passage of time has shown, however, that futurisms were risky hypotheses, even though prospects could establish "somewhat imprudent predictions."

The future itself would have collapsed, said Hartog (2015). In its place, a *regime of historicity* would have emerged that would establish the "omnipresence of the present": presentism (Hartog, 2006, p. 262)². It is a chronotope filled with "disciplinary vertigo" and even mistrust of so-called "new digital technologies," especially after the interconnectivity of people and their groups; of things, their *bubbles*, and other "communities of destiny." These are clear signs of the emergence of the *internet of things, big data*, and chronic instantaneity (Barros, 2022).

Certainly, the subject matter is distinct from that of Pierre Chaunu (1978) and those who have been inspired by quantitative history and serial expectations. In a chronocentric and chronosophical condition full of intense political, social, and economic perceptions, the discipline faces other "risky games": decolonization is one alternative. Otherwise, how can we sustain the temporality that characterizes the "universal subject" constructed in Europe, which imposed linear, empty, and homogeneous temporality on the rest of the world?

Characterizing elements of the perception of continuity for a future that has become progress or progressive, according to Reinhart Koselleck, would have acquired another semantics of historical times from a certain "*sattelzeit* of

² Recently, the *actualism* referred to by Pereira and Araújo (2016, 2019), in turn, would have rewritten the plot of temporal perception.

machines," in Bonaldo's conception (2023, p. 6). Because they are challenging, cultural categories related to "new media" are, according to Manovich (2001, pp. 64-65), derived from new meanings of "computer ontology," "epistemology," and "pragmatics," in order to promote a certain "cultural reconceptualization."

This means that other theoretical and methodological concepts of culture, digital culture, and historical culture are presented to professionals in the field—which requires understanding. According to Koselleck (2011), concepts can be appropriated through the metaphor of blocks (Bonaldo, 2024 a, p. 35; Koselleck, 2011, p. 8). The space-time dynamics of contemporary life also prompted the historian of *Begriffsgeschichte* to say that the perception of life between the "space of experience" and the "horizon of expectation" was that of a "spaceship" (Koselleck, 2006b, p. 216).

Metaphors—which frame concepts and help explain them beyond the "indigence of theory"—are neither ambiguous nor eternal (Koselleck, 2014, p. 277). How, however, can we think about the temporalization of digital objects, instant communication applications, games, and social networks from the chronocentric perspective of *criticism and crisis* in which the Ancien Régime declined, giving way to the new in the West (Koselleck, 1959)?

Therefore, it is considered that "every concept is linked to a word, but not every word is a concept" (Koselleck, 2006a, p. 108) and the concept of crisis has gained attention in a historiography of crisis (Koselleck, 2006b), or, rather, in a *historiographical regime* that now requires reflection on the digital. More than Lévy's cyberspace (1995) or Castells' sociological concept (2001, 2002), therefore, historian Noiret (2015, p. 31) asserted that "digital historical culture is part of a broader digital culture that permeates our society through the internet and in various forms of communication." This argument presented well-composed cultural layers that manifest themselves in tools, connections, and now historical research.

Based on the above, we propose to reflect on (1) the historical condition shaped by categories established in the methodology of history (2) a new semantics of machines and the temporalization of machines to finally address (3) artificial intelligence not with euphoria or even negligence, but with decolonial and ethical criticism. To this end, the relationship between digital cultures and digital

history, as well as digital intelligence, is presented in the following sections: the first concerns *artificial intelligence, historical consciousness, and methodology*; the second refers to *the semantics of machines, historical semantics: the problem of the castaway*; and the third addresses *decoloniality and ethics in digital society*.

It should be noted that the intention is not to defend a decolonial attitude that avoids critical dialogue with the matrix of colonial thought, just as it is not understood that failing to mention Western authors is in itself a decolonial gesture. Instead, weaving together the threads of Western matrices and then putting them to the test is a condition for the gesture that seeks to decolonize the subject of the *global South*.

Artificial intelligence, historical consciousness, and methodology

In Ricoeur (1985, pp. 107–119), historicity is the quality of being historical—which does not dispense with Heidegger's *ontological turn*: "the history of history is the history of being-in-the-world" and, later, of distancing oneself from it through *hermeneutics by the long route*. On the other hand, the inscription in the historicity of the digital world gives rise to reevaluations prompted by the emergence of a historiographical trend, digital history, which is gradually consolidating itself between the theory of history and digital public history:

In Brazil, even with the predominance of individual initiatives on the subject, it is noted that the variety of meanings and perceptions of what digital history is unfolds mainly in two ways: one that emphasizes the theoretical and methodological discussion involving the presence of digital technology in historical knowledge; the other, which strengthens ties with so-called public history, calling for experimentation in the use of digital resources to promote the dissemination, writing, and consumption of history by society in general (Nicodemo; Rota; Marino, 2022, p. 10).

It is possible to agree with Nicodemo, Rota, and Marino (2022) while still considering that, in the theoretical-methodological and digital public history spheres, the condition of possibility for digital history is the historicity of digital things. The quality of being historical implies human beings, their own historicity, and that of machines; their historical consciousness and, consequently, the

possibility of learning. In fact, is there a historicity characteristic of machines, or is the historicity of machines that of human beings? Isolating machines from humans seems wrong, but even worse would be to mirror human historicity in that of machines.

Human and machine historicities, as well as the theoretical-methodological or public paths of digital history (Lucchesi, 2014), may hinder empiricist approaches in times of abundant sources (Rosenzweig, 2011). What we seek, including digital history, is to overcome the stubborn *fetishism of method*, to quote Ethan Kleinberg, Joan Wallach Scott, and Gary Wilder:

Behind this fetishism of method lies an unthinking affiliation with “ontological realism.” Commitment to empirical data is central to this type of epistemology, which serves as a false floor to support the assertion that past events are objectively available for discovery, description, and interpretation. Here the tautology is evident: empiricist methodology allows for the control of this realism, while realism ensures the success of empiricist methodology (Wild on Collective, 2018).

If Tiago Gil (2024) warned of a certain return to “positivism,” we prefer to conceive of the possibility of reiterating *ontological realism* in the terms proposed by Kleinberg, Scott, and Wilder (Wild on Collective, 2018). By abandoning the meta-theoretical and, so to speak, meta-methodological condition, the field may suffer from a lack of reflexivity regarding the emergence of new perceptions of (digital) historicity. Failing to discuss digital possibilities or even generative artificial intelligence with particular emphasis after 2017 is to reiterate the risk. guiding dialogue in order to promote prohibitions or even “border patrols,” in Scott’s terms (1998, p. 397), however, may have consequences when reiterating the practice of history inscribed by the digital code.

Jörn Rüsen (2020), an exponent of History Didactics in Germany, *Geschichtsdidaktik*, considered that historical culture is a conceptual delimitation established among cognition, interpretation, and the attribution of meaning for the orientation of practical life. However, it is worth questioning whether historical consciousness—a category carefully considered by the author within a certain ideal typology of historical science—has been affected by digital culture, which has imposed a new chronological semantics of historical times or digital instantaneity.

For Rüsen (2001, p. 57), historical consciousness is the “sum of the mental operations with which men interpret their experience of the temporal evolution of their world and themselves, in such a way that they can intentionally guide their practical life in time”³. In this case, it is also possible to ask: in what terms have the “mental operations” of human beings changed as a result of emerging digital historicity? Is there such a thing as machine historical consciousness? Can machines learn?

The affirmative answer to this last question—that the “*more than human*” can learn!—does not exempt us from the difficulties surrounding the problem of consciousness as we have it in Jörn Rüsen, and, on the other hand, that elaborated by the philosophers of substantial or absolute time, whose perspectives have become somewhat heterogeneous (Salomon, 2018; Simon, 2021). The methodology of history faces dilemmas due to the possibility of knowing and acting through the “laws of the medium,” as in Certeau’s *historiographical operation* (1975). Now, however, the *anthropomorphic semantics* of the digital are on the horizon: “computer memory,” “machine learning,” “neural networks,” and even “hallucination” (Bonaldo, 2024a).

Not only does *Geschichtsdidaktik* have a semantics characteristic of human history since the foundations of the works laid by historians such as Johann Gustav Droysen, but several generations of history professionals have been trained based on Bloch’s (1952, p. 29) assertion: “*science des hommes dans le temps*” or, as Febvre (1950, p. 4) said in the inaugural issue of *the Revista de História da USP*: “science of man,” which “studies the works of man.”

Dománska (2024) and Simon (2021) did not fail to relativize this perception and, in a way, blur the links of anthropocentrism within the historical discipline. Because post-anthropocentrism, questioning the unity of the homocentric model of explanation and based on a model of reason restricted to the constitution of modern consciousness, rejected “speciesism” with Chakrabarty (2009), for example, and the disregard for animal life and other beings with LaCapra (2018).

³ It should be noted that there are a number of alternative understandings in the field of *Geschichtsdidaktik* (Saddi, 2010) and from previous authors who have addressed the subject of “historical consciousness” (Cerri, 2011).

If we are minority life forms, the perception of the digital, in turn, is mainly present in *human-computer interaction* (Bonaldo, 2023). That is, in a constant interaction between humans and machines. What seemed canonical and, therefore, returned in history classes, can now, at least, be discussed in terms of historical concepts: which science, which men, and which time?

If the machine learns, it is no longer just humans who learn—which does not mean that the machine has, or already has, or can have, "consciousness." Nor does it have historical consciousness *tout court*. Kansteiner (2022) put to the *test—the doping test*—the environment that seemed to color advanced discussions even in the field of philosophy of mind⁴. Although artificial intelligence can operate in the syntactic field, it would not, or would not yet, be capable of converting the field of syntax to semantics (although there is controversy)⁵.

In this case, as it would not yet possess sufficient semantic abilities, the emergence, or production, of a mentality, a mind, a consciousness, or "protoconsciousness" (Hayles, 2022, p. 164) would be impaired: this is when we refer to a "semantic barrier," which, however, is not unanimously accepted among scholars (Floridi, 2014, p. 142). In any case, the question of whether consciousness is necessary for all learning (including machine learning) calls into question meanings known among historians about the Eurocentric and modern consciousness project.

Even without specifically addressing the issue of generative artificial intelligence, Albaine (2019) proposed the of the existence of historiography shaped by digital technology and intended for history teaching: "school digital historiography," said the historian. Provocatively, Albaine (2019, p. 30) asked: "Beyond being a resource or auxiliary tool, what else can digital technologies be?"

⁴ To read about the philosophy of mind and theory of consciousness, we recommend the works of Chalmers: CHALMERS, David J. *Minds, machines, and mathematics: a review of Shadows of the Mind* by Roger Penrose. *Psyche*, v. 2, n. 9, 1995.

CHALMERS, David J. *The conscious mind*. New York: Oxford University Press, 1996.

CHALMERS, David J. *Propositional interpretability in artificial intelligence*. [S. L.: s. n.], 2025. Available at: <https://arxiv.org/pdf/2501.15740.pdf> Accessed on: Mar. 11, 2025.

⁵ We recommend reading Bonaldo's (2023, pp. 9-15) debate on "The Sattelzeit of machines: opening the doors of the Chinese Room?" regarding the syntax and semantics of machines.

However, we recall Salomon's (2018) multiple temporal matrix, now placed between the "utopian" and the "dystopian"; the "dread" produced by the advance of the power of *big tech*: far beyond can be regulated in the short term, if the machine moves on to semantic enhancement or the subsymbolic model (Bonaldo, 2023), and a new *sattelzeit* is in fact proven, would it be possible to have an awakened consciousness like that of the monster that awakens? So, would it be historical consciousness?

Would there be an-historical consciousness, not historicized or alien to the process of temporalization inherent to the digital world? Wulf Kansteiner seems to be resistant to this proposition, as does the Italian Luciano Floridi, who otherwise doubts the machine revolution in these terms, even when prospects seem to set the tone for new financial and market bets, or even those related to the "primitive accumulation of data" in Deivison Faustino and Walter Lippold: data seems exposed to all forms of mining and extraction.

Thus, the emergence of a "new territorial division of the globe among the large monopolies of the information industry" accompanies another trend, also called *data colonialism*:

What has come to be known as *i-colonialism*, or *data colonialism*, is one of the trends in the broader phenomenon that we refer to in this study as digital colonialism. This particular trend—which sometimes takes the form of *primitive data* accumulation—is noteworthy because it is responsible for an increasingly widespread and violent subsumption of human life to the processes of value enhancement (Faustino; Lippold, 2023, p. 91).

Beyond the *primitive accumulation of data*, there would be an accumulation of historical experience through other traces, and digital remnants of the past: the *contemporaneity of the contemporary*, now? A new way of building databases: historical sources characteristic of the *first phase* of Paul Ricoeur's historiographical operation? What is known is that interdisciplinarity—an important assumption of the Pedagogical Project of history courses, such as that of the Department of History at the University of São Paulo (USP)—is a foundation that transcends mathematics, computer science, and data engineering; through the imposition of accumulated calculations of experiences more or less vectorized by the machine.

Without being a “time machine” – but without ceasing to temporalize by means of the machine – the references to “models,” “qualitative mathematics” (Braudel, 1965, pp. 281-282), or “social mathematics” (Braudel, 1965, p. 286) in Braudel's classic text can be read as a revival rather than a disciplinary innovation. According to Braudel (1965, p. 282), models are not negligible and, thus, "qualitative mathematics" can be renewed models in the field of history.

Transposing, from another perspective, the chronotopic of almost inertial conformation, or in *longue durée* (Braudel, 1965), presides over the argument of Telles da Silveira (2022, p. 228): the "articulation between what is proper to history and what is proper to computing depends on the recognition of this situation," that is, the “digital turn in historiography, mentioned by Eric Brasil, is found there.” Because “it is not only a question of using digital technologies – computers, databases, social networks, analysis tools – but of understanding the transformations in the idea of knowledge brought about by the introduction of the computer” (Telles da Silveira, 2022, p. 228).

Technical microtemporality (Telles da Silveira, 2023) configures a new environment in which subjectivity ceases to be the sole defining element of the human, allowing interobjectivity to reenter to the investigation of technique (Hui, 2016). This perspective, however, has not been widely addressed by philosophers of history, such as Ricoeur (1983, 1984, 1985)⁶ , nor by historians such as Gumbrecht (2004)⁷ and Hartog (2015)⁸ . In this context, reflection on the notion of counted time (Stiegler, 2008; Telles da Silveira, 2023) is suggested, mediated by technology and, in this sense, immune to narrative (Cardoso; Nicodemo, 2019; Manovich, 2001).

⁶ RICOEUR, Paul. *Temps et récit*: l'intrigue et le récit historique. Paris: Seuil, 1983. t. 1.
RICOEUR, Paul. *Temps et récit*: la configuration dans le récit de fiction. Paris: 1984. t. 2.
RICOEUR, Paul. *Temps et récit*: le temps raconté. Paris: Seuil, 1985. t. 3.

⁷ GUMBRECHT, Hans Ulrich. *Production of presence*: what meaning cannot convey. Stanford, CA: Stanford University Press, 2004.

⁸ HARTOG, François. *Regimes of historicity*: presentism and experiences of time. New York: Columbia University Press, 2015.

Semantics of machines, historical semantics: the problem of the castaway

Bonaldo (2024b) cheered the shipwreck in the algorithm training he successfully conducts at the Federal University of Santa Catarina (UFSC)⁹, while Flávia Varella, from the same institution, upheld the notion of shared authority, as formulated by Frisch (1990)¹⁰, for a public history on the collaborative platform *Wikipedia* (Bevernage; Raphael, 2023; Castro; Rodrigues, 2024). Projects of different dimensions and assumptions that seem to retrace an institutional place, among others, of digital practices or even of foundations that enable incursions into virtual objects through diverse theoretical approaches.

The field is prolific and presents its own grammar, its digital grammatology; aspects of its face. With Hui (2016), it is possible to argue that digital may constitute a new technique for managing data, objects that appear to human users and are capable of reontologizing time. Digital objects take shape on the screen in various ways and become both between data and beyond data or storage and beyond data or storage, because they transcend the network environment: note, even before the expansion of generative artificial intelligence, the activities of the Museu da Pessoa, the Hemeroteca Brasileira, and, among many others, the Arquivo Público do Estado de São Paulo.

Chun (2008) emphasized the concept of “lasting ephemera” by operating both in the field of duration, familiar to historians, and in the sphere of the disappearance of data weakened by the circumstances of their materiality. The dilemma of data preservation has become particularly pressing for some of the most dedicated historians in the field of digital history, notably Rosenzweig (2011).

So one might ask: how can data be preserved and how much does it cost? In these times of “abundance of sources,” what can be done to preserve them? There is extensive discussion in the field about the preservation of data or sources, and it is possible to point out that history professionals no longer live with scarcity, although they try to survive the ephemeral that *crumbles (not only) on the networks*.

⁹ The different phases of Bonaldo's project (2024a), the constant collaboration of students, and the step-by-step approach used for data processing in artificial intelligence at UFSC are recorded in an article that has already been published, which is recommended reading.

¹⁰ For a discussion of the concept of “shared authority,” read the article by Shope (2016).

This is how Landsberg (2004) argued that memory could become prosthetic: emerging at the interface between a person and a story; in a space of experience between, for example, cinemas and museums, where an individual's story is subsumed into a broader perspective.

Therefore, events that are not necessarily experienced are inscribed in life and memory through experience (Landsberg, 2004). The mass media and digital society thus become part of large-scale prosthetic memory experiences. New mnemonic sensibilities focus on the digital field no longer only in the terms of Paul Ricoeur—still valid for *most* scholars—that sources are “coisic” elements when discussing traces, traces, and remnants of the past. If history is “a science of traces,” can traces be “ephemeral” and “prosthetic memory,” as are our *digital footprints*?

Marino (2024, p. 63) reflected on “How should historians empathize?”, noting that the question of “how historians should empathize” is “crucial because it advances discussions about the ethics and responsibilities of historians, such as self-awareness and self-assessment.” And Paul (2024, p. 4) revisited his important notion of values and virtues in relation to professional historians, including within the ethical field; virtues “serve as expressions for discussing the personal, attitudinal, and motivational aspects of research and teaching, which rarely emerge in methodological manuals or codes of conduct.”

The text “History and Politics of Recognition” by Chakrabarty (2024) was translated and published in *the Journal of History Theory*, from the Federal University of Goiás (UFG), indicating sensitive issues such as wounds, traumas, recognition, and historicity of unfortunate or bloody events. According to Chakrabarty (2024, p. 268), the “discipline of history needs to renew the statutes of the historians’ guild, which have long been linked to 19th-century ideas of citizenship, in order to respond to the ethical challenges of the present.” It is less about an awareness of “citizenship” and more about ethics aligned with what Rangel and Araujo (2015) called the “ethical-political turn.”

The machine does not (yet?) “empathize,” because, according to Cardoso and Nicodemo (2019, p. 33), it is humans who “empathize” and who do not achieve obsolescence in the pursuit of digital work: “the advantage of using a temporal

network created by robots in historical interpretation is comparable to using a microscope instead of the naked eye in the natural sciences." In addition to not "empathizing" like historians, the machine, or robot (in the case of *the historian bot*), "cannot interpret sources better than a human historian, but that human historian can do a better job with the help of the robot" (Cardoso; Nicodemo, 2019, p. 33):

Therefore, the historian robot is more of an exoskeleton than an automaton. It will not replace historians, but it will improve their work. In addition, this robot can help humans introduce reproducibility into the humanities [...] (Cardoso; Nicodemo, 2019, p. 33).

However, Bonaldo (2024b) actually celebrated the castaway. That is, the researcher attempted to organize his database by "scraping," "mining," and "processing data," but ran into difficulties. As historians of concepts also appreciate metaphors and metaphorical shifts, the Koselleckian *spaceship* now gives way to *shipwreck* (Koselleck, 2006b), but from the perspective of the historian-programmer who sometimes succumbs. Its fall is the very condition of realization.

In Koselleckian historiography, the metaphor of *the spaceship* illustrates the endeavor of historians to enter the space-time of concepts, exploring territories already known or not yet charted. In the current digital society, this image has been transformed: the contemporary historian resembles a castaway on an *island of ephemeral* and *scattered* data—where traces of digital memory often fade away. This other metaphor highlights the complexity resulting from the recomposition of knowledge, requiring a partial reformulation of investigative methods that combine rigorous approaches with the possibilities offered by emerging technologies (Guldi, 2023).

The Koselleckian *spacecraft* evoked a daring journey through *the cosmos of ideas*, but the figure of the castaway in digital history may lead historians to critically reexamine the foundations of the discipline in the light of the challenges posed by the dispersion and ephemerality of contemporary records. For this reason, Bonaldo (2024a) concluded that digital history dedicated to artificial intelligence had already entered the second phase of historiographical operation:

that dedicated to explanation/understanding¹¹. Even with the philosophical and even temporal limitations of Paul Ricoeur's production in the face of technology (Telles da Silveira, 2023)¹², it was with Ricoeur's historiographical operation that Bonaldo (2024a) moved forward.

Between the sociology of algorithms (Airoldi, 2022), the philosophy of mind (Chalmers, 1995), engineering, and programming (Brasil, 2022; Rota, 2022), the *machine habitus*, that is, the habit of machines, is formed. It is possible to venture into the fields of *habitus*, in that hermeneutic, and then test its limits. However, it is important to understand natural language programming (NLP), neural networks, *word embedding*, scraping, data processing, supervised machine learning, training, and all the constituent elements of programming as found in Bonaldo (2022), Brazil (2024), and Rota (2022).

It should be noted that the temporality inherent to machines—ontic temporality and technical microtemporality—may clash with the way time is structured in historical research. The time of programming may not be that of deciphering or writing history, but who said that programming is something alien to the historian's attitude in digital society? Such alternating temporalities are also due to the aforementioned *human-computer interaction*, which creates an asymmetrical relationship in which different processing rhythms and alternative modes of simulation coexist.

In the digital vortex of the present, programmer-historians resemble *archaeologists of algorithms*, unearthing layers of data and traces that help tell the story. Just as geologists interpret the strata that time has sedimented, programmer-historians decipher the binary code that, in its complexity, records the events, transformations, and ruptures of our era. Armed with mathematical logic and critical insight, each line of programming becomes an excavation tool, allowing them to reveal the *digital fossils of human interactions* and reconstruct

¹¹ Paul Ricoeur (1989) abolished—at least in his historiographical work and, above all, in his long-term hermeneutics—the bifurcation that largely underpinned the understanding of science: the *humanities* would comprehend, while the *natural sciences* would explain.

¹² To understand Paul Ricoeur's relevance in the field of contemporary philosophy of history, read one of Piercy's most recent articles (PIERCEY, Robert. Is Paul Ricoeur still relevant to the philosophy of history? *Rethinking History*, [n.p.], v. 28, n. 1, p. 1-26, 2024.).

history not in rocks, but in *bits* and *bytes*, where the flow of time intertwines in a narrative reconstructed with scientific precision and historical sensitivity.

However, the metaphor of Bonaldo (2024b) is still that of the castaway, who is celebrated because his trials and errors produce, *first and foremost*, the beginning of a phase of research or even the main research itself. *Secondly*, because there is an opportunity to "tame contingency" and thus produce research through new critical possibilities. *Thirdly*, it produces a kind of "non-repetitive updating," which could loosen the syntactic limits in the activity of programming, interpretation, and data processing, not only for archiving, creating *transformer models*, or even writing history.

In all cases, it seems fair to say that "our science is not built from port to port, but from shipwreck to shipwreck," as Bonaldo (2024b) said. For the historian, this would be enough to make one "able to maintain a derisive smile in the face of ridiculous, wrong, mind-boggling, yet inspiring results: the problem with contingency, after all, is that it usually comes back to haunt us" (2024b).

There is still room for further discussion. It is worth reflecting on the shipwrecks and the conditions of their failure. Variations, hallucinations, and mistakes in programming or training algorithms are understandable, but the consequences can be measured and the ethical dilemmas raised from decolonial thinking. This is the case of knowing whether, in Asimov's terms (1950, p. 40), the "laws of robotics"¹³ could converge with the principles set forth by Paul (2012) on *the values and virtues* of history professionals.

Decoloniality and ethics in the digital society

Belieiro (2024) wrote that "We have never been decolonial," seeking to criticize Eurocentric history in the historiography of teaching based on postcolonial and decolonial conceptions. Belieiro's (2024) important article is not,

¹³ Nicodemo and Cardoso (2019, p. 33) quoted Asimov (1950) arguing that the "robot historian must never be just a black box (Law number 1) in order to work transparently"; that a "robot historian must openly describe each step it has taken (Law number 2)"; and, in addition, a historian robot "must be able to run on a personal computer, which makes it accessible to anyone (Law number 3)." In the hypothesis of Nicodemo and Cardoso's (2019, p. 33) *historian bot*, this "basic set of rules can allow robots to be a tool and an educational tool."

however, controversial because it places postcoloniality and decoloniality side by side, while making the necessary distinctions. Before Belieiro (2024), several authors wrote about postcoloniality and decoloniality in order to understand similarities or differences, notably Ballestrin's (2013) article entitled "Latin America and the decolonial turn."

Without a more in-depth approach, it is possible to agree or disagree with the premise—controversial to some extent—that "We have never been decolonial." Consequently, with the idea of what would be "our non-belonging to the project of criticism of Eurocentrism, promoted by intellectuals from the global South since at least the 1970s" (Belieiro, 2024, p. 43). However, if the problem is not so simple in the historiography of history teaching, neither would it be in digital history and in the field of *algorithmic decoloniality* aligned with ethical assumptions.

The gesture of *doubt* is welcomed and even celebrated in contrast to what is *peremptory* or *definitive*. However, criteria must be established: "never" and "we were," of course, are negative and decisive abstractions that could be equivalent to *never* and *none of us*. ¹⁴ Less generalizing and more expressive in terms of sources is the thesis of Santos (2024), who distinguished a certain "Brazilian decoloniality," with which one may or may not agree.

If the meta-concept of "Brazilian decoloniality" is not immune to criticism, between the *particular* and the *general*, the *restricted* and the *broad*, it is something more close to historiographical verification. Without saying "we were never," one avoids saying "we always were" for reasons that are sometimes similar. Anti-colonial, counter-colonial (Santos, 2024)¹⁵ or decolonial attitudes of thinkers such as Kopenawa and Albert (2015), Krenak (2019, 2020a, 2020b, 2022)

¹⁴ To get an idea of the small number of sources for such a definitive statement as "We have never been decolonial," note what Belieiro (2024, p. 53) said: "we arrived at a total of 29 texts that were published between 2015 and 2024 [...] due to space limitations in this article [...] we understand that the concentration on articles focused on the discussion of curriculum and temporalities presents greater substance [...] In this selection, we covered 11 texts [...]."

¹⁵ SANTOS, Silmária Reis dos. *Uma decolonialidade à brasileira: perspectivas decoloniais entre historiadores(as) no Brasil*. 2024. 196 f. Tese (Doutorado em História Social) –Universidade Federal da Bahia, Salvador, 2024

and Santos (2023)¹⁶ , among others, are welcomed as a sign of vigor among historians.

Oliveira (2022), drawing on Haitian Michel-Rolph Trouillot (2016), argued that silences are unequal and should not be treated, or attempted to be eliminated, as if they were equal, which they are not. Regarding ethnic-racial relations, there are eloquent silences about a significant part of indigenous languages and artificial intelligence. Beyond languages, however, from *the time frame* understood by Mudrovic (2023) to be a manifestation of the politics of time, we now move to *the digital time frame*: who has the right to access the *territory* of artificial intelligence, or a *smartphone*, and how? From when and since when? The problem of *backwardness* arises again: "backward" peoples should be condemned to "backwardness," with no possibility of emancipatory consideration in the present.

Historian Ana Carolina Barbosa Pereira—already dedicated to the problems of historical theory, historical denialism on social media, and indigenous issues—seeks to understand the relationship between knowledge systems (including indigenous ones) and information systems. In her co-authored article entitled "Potential history: reading artificial intelligence from indigenous knowledges," she emphasized:

[...] indigenous knowledge contains an analogue for the prospects of AI achieving technological singularity, an analogue from which a form of historical understanding can be constructed that takes into account non-human or extra-human actors/agents (Bonaldo; Pereira, 2023, p. 5).

In this sense, decoloniality would be more than just a critique of the past. It would be a forward-looking stance and, equally, a critique of the foundations of historical knowledge production. The concept of "historical futures" by Zoltán Boldizsár Simon and Marek Tamm, in turn, raises questions about the Western

¹⁶KOPENAWA, Davi; ALBERT, Bruce. *A queda do céu: palavras de um xamã Yanomami*. São Paulo: Companhia das Letras, 2015.

KRENAK, Ailton. *Idéias para adiar o fim do mundo*. São Paulo: Companhia das Letras, 2019.

KRENAK, Ailton. *A vida não é útil*. São Paulo: Companhia das Letras, 2020a.

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SANTOS, Antônio Bispo dos. *A terra dá, a terra quer*. São Paulo: Ubu, 2023.

invention of the tripartite division of time (Mudrovic, 2024), as well as a certain optimism about the future: when we talk about *tomorrow*, which *tomorrow* are we referring to? The indigenous peoples, the quilombolas, the Latin Americans, the *big tech companies*? Even if the sufficiency of the present or presentism is duly questioned, optimism about the future—under the pretext of its survival—is also at least in a state of attention.

Mudrovic (2024, p. 41) stated: the idea of "empty, homogeneous time and its divisions into past, present, and future still operate in such a way in history in general and in the history of the present time in particular that, for some, it has become a mythical thought." For Tanaka (2019), modernity forged the assumption that abstract or mathematical time could unify, but history would have divided it into past, present, and future, and then classified it into periods or eras.

Artificial intelligence belongs to an unprecedented time, but in what sense? Although operating with the future and artificial intelligence, Bonaldo and Pereira (2023) reject naivety and work with emancipatory possibilities. To this end, they do not shy away from a more direct confrontation: "this encounter is also a confrontation between anthropocentric projects in Silicon Valley and anthropomorphic notions of Amerindian origins" (Bonaldo; Pereira, 2023, p. 26).

Digital colonial relations are durable and structured; they produce alternatives to colonial difference and demonstrate that "founding violence" is often embedded in the archives that delimit which pasts can be found in the supports. These pasts are also present in *the coloniality of data* on an unprecedented scale. The written forms of the past—found *in digital* footprints—are similarly "an attempt to describe obliquely the forms of violence authorized in the present" (Hartman, 2020, p. 31).

It should be noted, however, that displacing the future from a naive position in the midst of the age of artificial intelligence is by no means an anachronistic reiteration that indigenous peoples are doomed to disappear or that they have no expectations¹⁷. Thus, we must agree once again with Cunha (1992, p. 22) that

¹⁷ On August 7, 2023, in Belém, Pará, the Brazilian Institute of Geography and Statistics (IBGE) released the first results of the 2022 Demographic Census on the indigenous population during

indigenous peoples in Brazil were “thought of as ephemeral beings, in transition” destined for “Christianity, civilization, assimilation, and disappearance,” but that this conviction is untenable.

According to Monteiro (1995, p. 228), the extinction of indigenous peoples, “so often predicted, is emphatically denied by the ability of native societies to survive the most heinous attacks on their existence.” Hoping that “entire pages of the country’s history will be rewritten,” Monteiro (1995, p. 228) held that a “more balanced and, perhaps, optimistic space” could be reserved for indigenous peoples in historiography.

Beyond historiography, it is necessary to consider “digital colonialism” (Deivison; Lippold, 2023, p. 63) in the context of artificial intelligence through the “dispute over control and the flow of information” that enables the “acceleration of the production of goods and the circulation of capital” (Deivison; Lippold, 2023, p. 65). One can also conceive of the “maximization of profits” derived from “usurpation,” as well as from the “analysis of large amounts of private and collective behavioral data” (Deivison; Lippold, 2023, p. 65-66):

This new form of colonization and reification of souls, however, is still permeated by the old divisions of race, class, and gender that marked the development of capitalism. In fact, in the current phase of capitalist accumulation, colonialism is not limited to a metaphorical dimension, but is a fundamental economic element that enables the unequal and combined distribution of the contradictions arising therefrom among the nations and peoples of the globe (Deivison; Lippold, 2023, p. 65-66).

From another angle, it is appropriate to challenge the assumption that indigenous technology and knowledge operate in spheres that cannot converge, since it is not impossible to carry out decolonial programming that includes supervised learning in the field of artificial intelligence. “Algorithmic reason” is then established based on the input and output of data as *digital footprints* that stimulate criticism of sources. It is therefore possible to program in a decolonial way, since algorithms and artificial intelligence are not neutral (Bonaldo, 2024a).

the event “Indigenous Brazil: A New Picture of the Indigenous Population.” The survey recorded 1,693,535 self-declared indigenous people, an increase of 88% compared to the 2010 Census (Simoni; Guimarães; Santos, 2024, p. 1).

In Oliveira's conception, who prefers to ask himself "When will it be decolonial?", the paradox

[...] consists in the fact that, even though they have acquired notable visibility in contemporary historiography, certain groups of individuals do not transcend the status of *objects* of historiographical operation because, despite the recognition of their subaltern condition as "excluded from history," they remain without a place and without a part [...] (Oliveira, 2022, p. 60).

There is a need to do more than include the *other* in the grammar of *the same* in the field of artificial intelligence. It is therefore possible to mention Maria Beatriz Nascimento in dialogue with José Honório Rodrigues regarding the history of Brazil:

I would like to say that a phrase by José Honório Rodrigues, which has become almost a general statement, is that "the history of Brazil was a history written by white hands." Both Black and Indigenous people, that is, the peoples who lived here, together with the whites, do not have their histories written yet (Nascimento, 2018, p. 195).

The article by Assunção and Trapp (2021, p. 233) points out the so-called "white supremacy in the writing of history" and challenges coloniality within the historiographical sphere. It also examines the thoughts of Maria Beatriz Nascimento and Clóvis Moura in problematizing the "geopolitics of historical knowledge" in Brazil (Trapp; Assunção, 2021, p. 231) based on Dussel (2000), Maldonado-Torres (2007), Quijano (2000, 2005), and Quijano and Wallerstein (1992)¹⁸.

One may question whether the demand for a historiography produced by black authors – *by black hands!* – could, by analogy, extend to the need for

¹⁸ DUSSEL, Enrique. Europa, modernidad y eurocentrismo. *In: LANDER, Edgardo (coord.). La colonialidad del saber: eurocentrismo y ciencias sociales, perspectivas latino-americanas.* Buenos Aires: CLACSO, 2000. p. X-Y.

MALDONADO-TORRES, Nelson. Sobre la colonialidad del ser: contribuciones al desarrollo de un concepto. *In: CASTRO-GÓMEZ, Santiago; GROSFOGUEL, Ramon (coord.). El giro decolonial: reflexiones para una diversidad epistémica más allá del capitalismo global.* Bogotá: Siglo del Hombre, 2007. p. X-Y.

QUIJANO, Aníbal. Colonialidad del poder y clasificación social. *Journal of World-Systems Research*, [s. l.], v. 11, n. 2, p. 342-386, 2000.

QUIJANO, Aníbal. Colonialidade do poder, eurocentrismo e América Latina. *In: LAN DER, Edgardo (org.). A colonialidade do saber: eurocentrismo e ciências sociais.* Buenos Aires: CLACSO, 2005. p. 227-278.

QUIJANO, Aníbal; WALLERSTEIN, Immanuel. Americanity as a concept, or the Americas in the modern world-system. *International Social Science Journal*, [s. l.], v. 44, n. 4, p. 549-557, 1992.

programming developed by black people. Similarly, it would be worth inquiring about the relevance of programming conceived by indigenous peoples. Otherwise, the *new sattelzeit* may be even more colonialist, adhering to a decayed temporality even with the innovation of new digital historiographical emergencies as a condition for part of the historian, programmer, or historian-programmer.

According to Mudrovic (2023, p. 361),

Even when history becomes inclusive, through the multiplication of subjects, the political place they acquire through discourse is necessarily degraded. And if demands for recognition are functional in this historiography, it is because the subjects themselves identify themselves, in the discourse that constitutes them, as excluded and subordinate. This means that, by constituting themselves as subjects of historiographies, they acquire, *ipso facto*, a subordinate political representation within the discourse itself, that is, they are 'second-class' subjects.

Cardoso and Nicodemo (2019), in a pioneering study in Brazil, explored the intersection between historiography and artificial intelligence. They discussed not only hyper-archives, but also the conditions for an ethics grounded on transparency and access to the “black boxes” of machine data (Cardoso; Nicodemo, 2019, p. 46)¹⁹ .

Evidently, the ethical issues raised by Cardoso and Nicodemo (2019) are also relevant in the decolonial debate, because transparency is essential in combating so-called *algorithmic racism* – for example (Deivison; Lippold, 2023; Silva, 2022). Tarcízio Silva (2022, p. 14) demonstrated, not long ago, that algorithms are not neutral and that belief in their neutrality is naive or unlikely:

[...] racial democracy and neutrality in technology are two seemingly distant concepts, but they are united in their purpose of concealing power relations that construct interpretations of the world, naturalize and deepen exploitation and inequalities. At the convergence between the denial of racism and the denial of politics in technology lies what I have called “double opacity.”

The training of algorithms is never neutral, just as history cannot be neutral; neither can memory or even the totality of criticism of sources. Cases of racism associated with facial recognition systems and *hate speech*—which logically

¹⁹ Nicodemo and Cardoso (2019, p. 46) said that, in principle, a “black box is a system accessible only in terms of its input, output, and transfer functions, without any knowledge of its internal workings.”

exceed the limits of freedom of expression—highlightening the dilemmas faced by lawyers, programmers, and historians. The *chatbot* Tay, for example, when exposed to data from a social network, quickly reproduced xenophobia, racism, and anti-democratic discourse from the extreme right, demanding fruitless and embarrassing reparations (Silva, 2022).

Of course, in many ways, digital colonialist relationships are woven through the fabric of the artificial intelligence era. However, ignoring discussions about artificial intelligence, robot historians, machine consciousness, and digital decoloniality does not seem to be the best alternative for the community of *digital footprint* critics. *Deepfakes*, such as those used in *Star Wars* productions, during election periods, or in the recreation of Elis Regina in a car manufacturer commercial, raise ethical questions that are not always successfully addressed.

The quality of *outputs* can be measured by *inputs* (although the discussion is not so simple), and proper programming can produce a critical historiography of coloniality. It is not just a matter of including the *other* in the grammar of *the same*, but of critically reconsidering the temporal matrix of the digital world and, after the decline of *the linguistic turn*, rethinking new ways of approaching the *same and the other in itself*. Achieving material things, however digital they may be.

Final considerations

Delacroix (2012, p. 303) used the expression “statistical intoxication” to address serial or quantitative history. With quantitative history now surpassed, the metaphor of the drunkard cannot be fully applied by digital history, as it is a field of castaways seeking survival and self-reflexivity in digital practices. In this case, the “historian of tomorrow,” in relation to Ladurie’s yesterday (1973, pp. 13–14), is sometimes a programmer, sometimes not. There are those who do not even intend to be programmers, although they are nonetheless digital historians.

It is possible to understand why Delacroix (2012) uses the metaphor of “statistical intoxication” for the outdated quantitative fascination. Ladurie (1973, p. 20) stated: “in the extreme [...] only quantifiable history is scientific.” However, there is no point in working “like an underground miner” who “goes deep into the earth to fetch data and brings it back to the surface” if one cannot consolidate

the relative autonomy of the field, carve out its object, and, after the heuristic gesture, proceed with the hermeneutic one (within the limits of hermeneutics) while moving on to writing history.

Artificial intelligence is part of the post-anthropocentric reality experienced by historical theory and historiography, but it can reinforce the digital reproducibility of coloniality that consolidated the *universal European subject*. For this reason, and for others, it is argued that the *decolonial* attitude is an alternative due to the expansion of generative artificial intelligence. With the intention of achieving the decolonial proposal, it was necessary to retrace a path.

This article examined the relationship between historiography and artificial intelligence, addressing methodological and epistemological challenges in the digital age. Initially, it discussed the reconfiguration of historicity in the face of traditional methodological realism and new temporalities, expanding the notion of historical consciousness to include systems and machines.

Next, the semantics of machines and the interpretive dilemmas of digital data were analyzed, highlighting the transformation of historiographical methodology in the face of the ephemeral traces of the digital past. Finally, using a decolonial approach, the reproduction of Eurocentric models in historiography and algorithms was questioned, advocating a critical and emancipatory practice in digital historiography.

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