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Artificial Intelligence through the Lens of Martin Heidegger's Philosophy of Technology

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Abstract: This article approaches artificial intelligence (AI) through the philosophical perspective of Martin Heidegger, arguing that AI should not be regarded merely as a technical tool but as a paradigmatic expression of the essence of modern technology: *Gestell* (enframing). For Heidegger, *Gestell* is a mode of revealing in which the world and human beings are transformed into *Bestand* (standing-reserve), that is, entities or resources ready for optimization and exploitation. AI, with its immense capacities for data processing and computation, replicates the entire logic of *Gestell*: it reduces life, language, and even the human being to manipulable units of data. Heidegger warns that the dominance of *Gestell* leads to nihilism, wherein the logic of calculation obscures the meaning and being of things. In response, he does not call for the rejection of technology. Instead, he proposes an attitude of *Gelassenheit* (releasement) and *meditative thinking*, aiming to cultivate a "free relationship" with technology – an understanding of the danger of enframing and the possibility that attentiveness to this danger may open a path toward a saving power. This article argues that AI is not merely a technical challenge but also poses profound ontological questions concerning human existence and freedom in the digital age.

Keywords: Martin Heidegger; artificial intelligence (AI); Gestell; Gelassenheit.

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1. Introduction

Martin Heidegger (1889–1976) is widely regarded as one of the most influential philosophers of the twentieth century, particularly for laying the foundations of the modern philosophy of technology. Although he died before the rise of contemporary generative AI, the World Wide Web, and today's large-scale digital language-processing systems, his reflections on the essence of technology continue to offer a profound conceptual framework for understanding contemporary technological phenomena. Among the select few philosophers who treated technology as a serious philosophical problem, Heidegger stands out as a pioneer in this field. As Ihde observes, Heidegger "was among the first to raise technology to a central concern for philosophy, and he was among the first to see in it a genuine ontological issue" (Ihde 2010: 28).

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In the secondary literature, some scholars have suggested that the seeds of Heidegger's critical thinking on modern technology can already be found in *Being and Time* (1927) (Dreyfus 1992; Hui 2021). Nevertheless, there is a general consensus that it is Heidegger's later works, particularly *The Question Concerning Technology and Other Essays*, that most fully articulate the depth and complexity of his philosophy of technology. However, as Godzinski observes, "His thoughts are typically abstruse when they are at their best, and when they are at their worst, they are virtually impenetrable" (Godzinski 2005: 115). This difficulty is partly due to the fact that Heidegger never formulated a single, comprehensive theory of technology; instead, his thoughts on the matter are scattered across a wide array of texts. As a result, Heidegger has often been interpreted as adopting a pessimistic or even hostile stance toward technology. However, as Don Ihde (2010) points out, such interpretations are "superficial" and fail to capture the nuance of Heidegger's position. Rather than rejecting technology, Heidegger seeks to uncover its essence: "the essence of technology is by no means anything technological" (Heidegger 1977: 4), which he describes as a mode of human engagement with the world known as *Gestell* or "enframing" (Heidegger 1977: 19). For Heidegger, then, technology constitutes not merely a technical or instrumental issue, but an ontological one (Ihde 2010: 28), serving as a foundational insight for any critical reflection on AI in the digital age.

Heidegger's approach offers a distinctive lens through which to analyze the impact of the relationship between humans and AI. He contends that technology is not simply a neutral means to an end but a mode of revealing that discloses the world to us while simultaneously shaping our understanding of reality (Heidegger 1977: 12–13). When applied to AI, this perspective allows us to interrogate the underlying assumptions and value-laden structures embedded in the design and operation of intelligent systems. On this basis, Heidegger's framework serves as a powerful critical tool for exploring the philosophical and ethical dimensions of AI, guiding more reflective decisions about the place and meaning of this technology in human life.

Philosophy of technology also offers approaches that illuminate dimensions Heidegger does not foreground. Affordance theory examines the possibilities for action that an environment makes available to an embodied agent (Gibson 1979), while Latour's account of technical mediation traces how human and nonhuman actants jointly transform programs of action within concrete networks (Latour 1999). Heidegger and Latour therefore share a rejection of both simple technological determinism and purely social explanation, but they ask different questions: Latour reconstructs how agency is distributed in particular sociotechnical arrangements, whereas Heidegger examines the historically dominant mode of revealing within which entities, including human beings, come to appear as *standing-reserve* (Khong 2003). This article focuses on Heidegger because it asks how pervasive practices of calculation, prediction, and optimization can become a governing horizon of intelligibility. That question operates at a different level from inquiries into what particular systems afford or how agency is distributed within them.

Any contemporary use of Heidegger must also confront the political and ethical controversy surrounding his work. Heidegger joined the Nazi Party in 1933 and served as rector of Freiburg University

under the regime; the publication of the *Black Notebooks* beginning in 2014 provided further evidence of antisemitic motifs in his thinking. Scholars continue to dispute how deeply these commitments enter his ontology and whether his concepts can be used without reproducing their political exclusions (O'Brien 2010; Wolin 1993; Farin and Malpas 2016). This article neither treats that record as a merely biographical matter nor attempts to resolve the entire controversy. It adopts a limited and critical use of *Gestell* and *Gelassenheit* for the analysis of AI, while recognizing that Heidegger's account cannot by itself supply an adequate ethics or politics of technology.

This article employs well-established research methods commonly used in philosophical inquiry, including the analytical–synthetic method, the logical–historical process, and the comparative method. The article aims to elucidate Heidegger's conception of the essence of technology and to examine the implications of this concept for how we think about and interact with AI, thereby better informing choices regarding the role and position of this technology in human life.

2. The Essence of Modern Technology: *Gestell* (Enframing)

Approaching AI from the philosophical perspective of Heidegger requires, first and foremost, a thorough understanding of the central concept that underpins his thinking on the essence of modern technology: *Gestell*. It is within the scope of this notion that Heidegger not only offers an ontological redefinition of technology but also reveals the deeper dimensions of the relationship between human beings, the world, and Being. These dimensions are crucial for a proper understanding of the nature of AI in the contemporary technocratic era.

2.1. What is Gestell*?*

In his lecture *The Question Concerning Technology*, Heidegger formulates a novel and foundational philosophical framework for reflecting on technology by posing a deceptively simple yet profound question: "What is technology?" (Heidegger 1977: 4). For Heidegger, this question must not be understood merely in instrumental or functional terms; instead, it must be approached as an ontological question, that is, as a question concerning the essence of technology (Heidegger 1977). Nevertheless, Heidegger does not seek to offer a fixed or final definition of the "essence of technology." His goal, instead, is to help us to recognize that, if we wish to understand what he means by this expression, we cannot continue to conceive of "essence," in a traditional Platonic sense, as that which "permanently endures." To do so would reduce the phrase "essence of technology" to a kind of mythological abstraction. Instead, we should think of "essence" as a verb: as the way in which things "essence" (*west*) or "remain in play" (*im Spiel bleibt*) (Thomson 2025: 37).

Heidegger begins his inquiry into the nature of technology by presenting two widely accepted definitions that have become emblematic of modern technological thinking: "Technology is a means to an end" and "Technology is a human activity" (Heidegger 1977: 4). However, Heidegger does not endorse these definitions as absolute truths. Instead, he contends that they merely describe the superficial appearance of technology without reaching its ontological depth. As he writes:

The two definitions of technology belong together. For to posit ends and procure and

utilize the means to them is a human activity. The manufacture and utilization of equipment, tools, and machines, the manufactured and used things themselves, and the needs and ends that they serve, all belong to what technology is. The whole complex of these contrivances is technology. Technology itself is a contrivance, or, in Latin, an *instrumentum* (Heidegger 1977: 4–5).

In the notion of *instrumentum*, Heidegger discerns a twofold structure of meaning: on the one hand, technology is a collection of tools and equipment; on the other, and more profoundly, it is a specific mode of human action, namely, the use of means to attain an end. This second dimension concerns purposive action, but it does not by itself establish that every human action is technological. Pitari formulates—and then critically interrogates—the stronger inference: "Therefore, human beings are essentially technological beings; that is, objectifying beings (who use things as instruments)" (Pitari 2022: 50).

From this point of departure, Heidegger expands his analysis by criticizing the positivist inclination of modern thinking, which tends to understand technology merely as a set of tools fabricated and employed by humans to achieve particular objectives. This shift from the instrumental to the ontological register is concisely formulated by Lovitt: "the 'essence of technology' is the very mode of Being's revealing of itself that is holding sway in all phenomena of the modern age" (Lovitt 1977: xxviii).

The essence of technology, therefore, cannot be reduced to or identified with any specific machine or technical apparatus, for it existed long before the advent of what we today typically regard as icons of technology, from nuclear weaponry and computational systems to the internet, autonomous vehicles, gene-editing technologies, and AI. As Heidegger argues, we cannot inductively derive a concept of the "essence of technology" through the study of particular (ontic) technologies. Instead, what he calls the (ontological) "essence" of technology was already historically operative before the development of these machines; in fact, it is this ontological condition that made possible their conceptual emergence and eventual dominance. As Thomson observes, "the 'essence of technology' was in place historically before such machines were developed; in fact, its being in place helped set the conceptual stage for their historical emergence and growing dominance" (Thomson 2025: 38).

Heidegger acknowledges that the two traditional definitions of technology – the instrumental and the anthropological – are "uncannily correct," and that they "even hold for modern technology, of which, in other respects, we maintain with some justification that it is, in contrast to the older handwork technology, something completely different and therefore new" (1977: 5). However, it is precisely this correctness that harbors the danger of concealing the truth. By focusing only on what appears on the surface, these definitions prevent us from penetrating the ontological ground where technology operates as a mode of revealing. Heidegger calls the historical "sending" that first sets human beings upon a path of revealing a "destining of revealing" (*Geschick des Entbergens*). This does not mean an inescapable fate: destining grants a field of disclosure to which human beings belong and within which a free relation remains possible (Heidegger 1977: 24–25).

It is from this limitation that Heidegger begins to expand his thinking on technology, describing it as a "setting-forth," a

contrivance, encapsulated in the Latin term *instrumentum*. Yet for Heidegger, technology is not merely an assemblage of tools or means. It constitutes a comprehensive structure that mobilizes not only things but also human beings into a state of availability for production and control. His key term designates this totalizing structure: *Gestell*. Commonly translated as "enframing" or "positionality," *Gestell* denotes a mode of revealing that characterizes modernity. It is not a type of machinery or a device but rather a style of thinking and a metaphysical framework through which the world is interpreted and structured (Wendland 2019: 156). As Yuk Hui emphasizes, *Gestell* operates as a totalizing force (Hui 2019: 105). Van Mazijk succinctly articulates this point: "By 'enframing' (Gestell), Heidegger means precisely that interpretative scheme or frame shaped by the essence of technology. It thus captures the general way things are manifest" (2019: 524).

According to Heidegger, *Gestell* constitutes the profound essence, or more precisely, the nature of modern technology. In 1953, Heidegger delivered his groundbreaking lecture *Die Frage nach der Technik* (*The Question Concerning Technology*), in which he asserted that "the essence of modern technology is nothing technological, but rather enframing (*Gestell*)" – a transformation in the relationship between humanity and the world, wherein all beings are reduced to the status of standing-reserve or stock (*Bestand*), that is, entities rendered measurable, calculable, and exploitable (Hui 2016: 3).

With the term *Gestell*, Heidegger does not refer to tools or instruments in the conventional sense, but rather to "a very general and implicit way in which things presumably appear." He designates this particular interpretative framework as the "essence" of technology to distinguish it from the more mundane "anthropological" understanding of technology as a collection of tools or specific technical characteristics. Thus, the "essence" of technology does not denote any particular instance of technological manipulation, but rather a dominant and coercive horizon of understanding that imposes itself on all entities, shaping our interactions with them and our thinking about them (Van Mazijk 2019: 524).

In Heidegger's philosophy, then, *Gestell* is not merely associated with modern technology; it is its very essence in the ontological sense. Under the condition of *Gestell*, technology ceases to be a neutral means subject to human will. Instead, it becomes a totalizing and coercive mode of revealing in which all beings are reduced to functional availability. Yet, the recognition of *Gestell* also unveils a latent possibility: that humanity might transcend technocratic thinking and thereby open up an alternative mode of revealing, one in which truth is no longer obscured by technical calculation, but is instead disclosed more freely through a harmonious relationship between human beings and Being itself.

2.2. Gestell *and the Standing-Reserve: The Ontological Displacement of Being*

One of the most profound manifestations of the essence of modern technology under the mode of *Gestell* is the transformation of all beings into *Bestand*, that is, "standing-reserve." This means that all entities, including human beings, are reduced to resources readily available for ordering, mobilization, and exploitation within a technological system. Beings, including humans, are no longer experienced as entities with intrinsic value but rather as "resources" awaiting deployment within a

technological operation. Heidegger powerfully illustrates this through the image of the Rhine River, a long-standing cultural and natural symbol of Germany. The Rhine is no longer revealed as a natural river but as a water power supplier for a hydroelectric plant or a resource for the tourism industry (Heidegger 1977: 16). Heidegger warns that such a mode of revealing alienates us from the deeper meanings and relational dimensions of existence. This insight also bears on contemporary AI systems that translate persons and their contexts into data profiles optimized for prediction and intervention. Interpreted through Heidegger's analysis, such systems risk disclosing persons primarily as manageable inputs rather than as beings with irreducible significance (Woods 2025).

The reach of *Gestell* does not end with inanimate objects; it extends into agriculture and human life. Belu and Feenberg discuss Heidegger's notorious 1949 claim that mechanized agriculture is "in essence the same as the production of corpses in the gas chambers and the extermination camps" (2010: 5). They immediately object that "here the argument breaks down" (2010: 6), because an account of total enframing cannot simply erase the specifically human capacity for world-disclosure that enframing itself presupposes. The comparison should therefore not be presented as a morally acceptable equivalence. It instead exposes a serious limit in Heidegger's attempt to describe heterogeneous forms of technological ordering at a single ontological level.

Thus, under the sway of *Gestell*, the world is no longer inhabited by humans as a place of truth (*aletheia*), but is requisitioned within a technological network of operations, wherein all things are subjected to measurement, arrangement, exploitation, and control. *Bestand* is not merely a condition of things, it is a mode of world-disclosure shaped by a violent metaphysical outlook, in which beings are rendered present only insofar as they can be optimized. Overcoming this condition does not entail a nostalgic return to a pre-technological past, but rather the recovery of a thinking that meditates on *revealing*, on a mode of being in which the human being is no longer the "supreme engineer" of the world, but a listener to Being in silence.

2.3. Gestell *and the Triumph of Quantification: Calculative Thinking and Nihilism*

As a historically situated *mode of revealing* in which beings increasingly appear solely as resources to be optimized, *Gestell* gives rise to a distinctive form of thought that Heidegger calls *calculative thinking (das rechnende Denken)*. Like the fabled touch of King Midas, this mode of thinking transforms all qualitative relations into quantifiable ones. Such an "infinite quantification," which absorbs and flattens all qualities until we come to treat "quantity as quality," emerges from the ontologically reductive character of enframing. Within this framework, "only what is calculable in advance counts as being" (Thomson 2005: 57).

This marks one of the central manifestations of *Gestell*, the operational structure that discloses the essence of modern technology. Calculative thinking *(Berechenbarkeit)*, as Heidegger calls it, becomes dominant under this regime, a mode of thought that reduces the entire world to that which can be measured, computed, and manipulated as variables within rational systems constructed by humans. All entities are subsumed within the order of calculability, an order governed not by Being (*Sein*), but by the smooth, optimized, and predictable functioning of technocratic processes. In this context, *the*

principle of sufficient reason becomes the instrument through which the assimilation of all beings into a universal system of quantification is carried out (Hui 2019: 231).

Heidegger warns that *calculative thinking* is not merely an epistemological method, but a deeper forgetfulness of the essence of beings. It replaces things with functions, names with variables, to follow a path of its own construction. With such thinking entrenched, it is the function that counts, not the thing. Things are *Gleich-gültig*, indifferently valid; individually, they count for nothing. Their ordinary names remain, of course, and with them we are still fully capable of correctly marking distinctions in practice and discerning their "value" (Crowell 2019: 81). The alarming implication here is not merely that humans use technology to dominate beings. Rather, it is that beings themselves are stripped of their ontological dignity – of their very claim to being. What makes them "worthy of being" *(seinwürdig)* is no longer their own inherent essence, but the functional role they fulfill within a technical system.

This ontological deprivation constitutes a subtle and insidious form of nihilism, a condition Heidegger terms *Verwahrlosung* of the thing as thing, that is, "the abandonment of the being of the thing as thing," or what he elsewhere describes as the "bereaving [of] things of truth" (Crowell 2019: 81). Within the horizon of calculative thinking, things no longer "speak" their being; they no longer have the capacity to disclose Being but merely subsist as *Bestand*, resources ready for extraction, mobilization, and deployment. Here, beings no longer stand before us as presences to be understood; rather, they are absorbed into the logic of instrumental operation, functioning as indispensable yet meaningless nodes in an overarching system of optimization. So, "no matter how things show up in our dealings with them as teachers, parents, or carpenters, their presencing has been drained of meaning, and we experience them as Bestand-stücke (components of standing-reserve)" (Crowell 2019: 81).

Heidegger warns that this universal calculability is not a neutral epistemological instrument but an ontological determination, insofar as it shapes the very conditions under which the world may appear to us. Within this framework emerge what Thomson calls "empty optimization imperatives" (2005: 22): demands that do not ask "Why?" or "For what purpose?" but merely "How can it be done more efficiently?" Thinking, under this regime, becomes mechanical operation, and operation has no capacity to pause for thought. This is the ultimate form of the *forgetfulness of Being*, wherein human beings, precisely at the moment they imagine themselves in absolute control, have already exiled themselves from the horizon of meaning.

Thus, in Heidegger's view, calculative thinking and nihilism are not two distinct phenomena but rather dual expressions of a deeper crisis: the exclusion of Being from modern experience. To liberate thought from the seductions of calculation is not to reject reason, but to restore the capacity for *disclosive thinking*, the ability to let things appear as they are, and not merely as what can be mobilized.

3. AI through the Lens of *Gestell*

AI, with its unprecedented capacity to collect, process, analyze, and optimize data on a scale unmatched in the history of technology, stands as one of the most exemplary and intensified manifestations of *Gestell*, the ontological structure through which reality is requisitioned, mobilized,

and reduced to usable entities, ready for calculative manipulation and control. In this sense, AI is not merely a product of modern technology; it is also the site at which the essence of technology, in Heidegger's sense, is most concentrated and most radically projected.

3.1. AI as a Paradigm of Gestell

One frequently overlooked dimension of AI is ontological: the question is not simply what kind of entity an AI system is, but how such systems are situated within and transform human practices of understanding. A Heideggerian inquiry therefore does not stop at classification. It asks how AI participates in the relations through which beings become intelligible and how its use reshapes those relations. The central issue is consequently not only whether AI possesses 'genuine intelligence' or 'consciousness,' but how its integration into everyday practices alters the structures of human understanding.

Typical AI machines consist of both hardware and software components, working in concert to perform a wide variety of tasks. The hardware includes physical elements such as processors, memory, and storage devices; the software comprises programs and algorithms that enable the machine to process data and make decisions. These machines are designed to simulate human intelligence, possessing the capacity to learn from experience, recognize patterns, and solve complex problems. From such a description, AI might be regarded as a machine or tool created to meet human needs. Yet it is precisely this reduction of technology to a mere instrument that Heidegger challenges in *The Question Concerning Technology* (1977), where he argues that the essence of technology does not reside within the machines themselves, but in the way they disclose the world.

For Heidegger, technology is not merely a means to an end; it is a mode through which human beings understand and interact with the world. Hence, technology is not confined to machines or devices but encompasses all human activities that involve revealing and bringing forth (Heidegger 1977). Heidegger's ontological inquiry aims to determine the essence of technology and its role in our experience of the world. In the same vein, AI's role ought to be seen as one of disclosure rather than distortion of reality. Instead, human beings have become dependent upon technology, even when denying it, by regarding it as neutral, a stance that obscures technology's true essence.

If we continue to view AI as a neutral tool, we risk overlooking its potential to distort our understanding and perception of reality. It is therefore crucial to approach AI critically, recognizing its capacity to shape perception and actively interrogating its role within our experience of the world (Heidegger 1977: 4; Carabantes 2021: 696–697).

The internet, in particular, and AI systems more generally, can be regarded as paradigmatic exemplars of modern technology in the Heideggerian sense, for they embody fully and profoundly the core ontological characteristics of *Gestell*. Carabantes (2021) argues that the internet constitutes a space in which the entire sequence of "setting-upon," "challenging revealing," "revealing of what-is as standing-reserve," and "multiple concealment" unfolds simultaneously, with great intensity and within an extensive systemic reach. This quality renders the internet not merely as a technical tool or means but the formalization of the entire mechanism of modern mobilization, a site where reality is both disclosed and

simultaneously obscured within a network of total requisition.

From a philosophical standpoint, technology is not simply an assemblage of tools serving human purposes, but a mode through which what-is becomes manifest. On Carabantes's reading, Heidegger treats technology as a mode of revealing (eine Weise des Entbergens); because truth in its more originary sense is revealing prior to correspondence, technology belongs to the happening of truth (Carabantes 2021: 696; cf. Heidegger 1977: 12–13). The relevant question is therefore how beings have already been disclosed as intelligible before propositions can correspond to them. Modern technology is a mode of revealing, but a restrictive one: it discloses beings as standing-reserve rather than simply allowing them to appear on their own terms.

Extending this perspective to the domain of the internet or AI, it follows that AI cannot be reductively understood as a neutral tool wielded by humans; rather, it must be conceived as a mode of cognition, a lens through which we approach and construct the world. It institutes a specific form of "disclosure" of reality, thereby shaping the way we see, understand, and inhabit the world around us. Indeed, AI harbors the capacity to reveal a vast spectrum of realities that have either remained concealed or have never been connected in such a manner before: from cultural products such as films (Netflix) and music (Spotify), to social relationships (Facebook), and an immense range of material commodities (Amazon), among others.

AI, in its very capacity to transform all modes of being – from natural language, images, and sounds to human emotions – into data points capable of being processed, reproduced, and optimized, manifests an intensified operation of *Gestell* as critiqued by Heidegger. By quantifying qualitative relations and reducing entities to programmable information, including "digitized data ready to enter into 'a state of pure circulation' on the internet" (Thomson 2005: 56), AI not only makes visible the technical structuring of the world but also participates in a distinctive form of revealing, namely, a challenging-revealing in which what-is is apprehended solely as "standing-reserve." At this level, AI is no longer merely technology; it becomes the consummate manifestation of *Gestell*, a total mobilization of beings into the operational, calculative, and controlling logic of modern technicity.

3.2. The Human Being as Standing-Reserve in the AI Era

Within the epoch of *Gestell*, beings are increasingly disclosed as Bestand—standing-reserve available for ordering. Human beings can also be ordered as resources, yet Heidegger insists that they do not belong to enframing in the same way as machines. *Gestell* should therefore not be described as simply erasing the human capacity for disclosure. Its danger lies in narrowing the field of intelligibility so that beings, including human beings, appear primarily in terms of availability, calculation, and optimization (Heidegger 1977: 17, 27; Wendland 2019: 156).

Within *Gestell*, human beings too can be treated as interchangeable components of an ordering process. Yet Heidegger does not simply equate human beings with machines. As quoted by Belu and Feenberg, he writes: "The human being is exchangeable within the ordering of standing-reserve. Because he is a stock-piece the assumption holds that he can become the functionary of an ordering. Nevertheless man belongs in an entirely different way to enframing than does the machine. This way can become in-human.

[…] The human being of this epoch is, however, enframed by enframing, even when he does not stand immediately in front of machines and operates machinery" (Belu and Feenberg 2010: 6). Belu and Feenberg emphasize that this difference blocks any straightforward reduction of human beings to technical components.

The deeper danger is therefore not that human beings literally cease to be 'natural,' but that they increasingly understand themselves and others through functional categories of performance, availability, and optimization. Heidegger nevertheless insists on a decisive asymmetry: although human beings can be ordered within standing-reserve, they are also those to whom the revealing of *Gestell* is addressed and who may become aware of it (Heidegger 1977: 27; Belu and Feenberg 2010: 6). This distinction preserves the possibility of a critical relation to technological ordering without placing human beings wholly outside it.

In the contemporary context, the human use of AI for creative or intellectual labor is no longer merely the application of a tool; it can alter how authors relate to their own activity. As Boone observes, when "we abandon our responsibility to shepherd our own work, and we become tools in the machinery of creating a written product, even letting the software guide us rather than the other way around" (Boone 2024: 28), the concern is not simply operational dependency but the possible surrender of responsibility for articulating and interpreting meaning.

Boone extends this concern to AI-assisted writing: when authors let software guide composition, they risk becoming instruments within a production process instead of remaining responsible for its direction (Boone 2024: 28). This does not establish that every use of AI destroys individuality; it identifies a possible reorientation of authorship toward output and efficiency. A related historical motif appears in Heidegger's criticism of mechanized writing: as Ihde explains, the typewriter standardizes the written mark and obscures handwriting as an expression of character (Ihde 2010: 121).

This reflection extends Heidegger's earlier remarks on the printing press and the typewriter. For Heidegger, the typewriter was a symptom of the technological age; with its advent, the visible presence of the hand and the site where language is disclosed gradually vanished (Heidegger 1992: 81). As he argues: "The typewriter tears writing from the essential realm of the hand, i.e., the realm of the word ... Mechanical writing deprives the hand of its rank in the realm of the written word and degrades the word to a means of communication" (Heidegger 1992: 81; see Winkler 2019: 326).

Thus, in the present age, integrating AI into linguistic creation poses risks not only at the levels of content and operation but also at the ontological level: human beings may cede part of their responsibility for interpreting and articulating meaning, while language is increasingly treated as material for automated processing. The risk, on a Heideggerian reading, is not that AI literally removes human individuality or Dasein, but that it narrows the ways in which persons and the world can become intelligible by disclosing them chiefly through the logic of standing-reserve (Heidegger 1977: 27; Heidegger 1992: 81).

3.3. The Dominion of Cybernetics and the Loss of Human Privilege

The present dominance of technology is not accidental but conditioned by the enframing essence of *Gestell* (Ma and van Brakel 2014). Hui characterizes cybernetics

not simply as a specialized discipline but as a totalizing, "exclusive rationality" that tends to displace other modes of understanding (2019: 105). Under this cybernetic horizon, human thinking is increasingly modeled as formalizable information processing. A Heideggerian critique asks what dimensions of understanding are obscured by that model, without treating the human being as nothing more than an information-processing subject.

The issue is not a merely technical change but the possible narrowing of the human capacity to sustain an open relation to Being. As translated by Dreyfus, Heidegger observed that "the determination of language as information originally supplies the basis for the construction of thinking machines, and for the construction of large-scale computer installations," and that "information theory is, as pronouncement, already the arrangement whereby all objects are put in such form as to assure man's domination over the entire earth and even the planets" (Dreyfus 1992: 336). The reduction of language – traditionally the locus of truth's disclosure – to mere "information" risks obscuring its non-instrumental dimensions and supports a modernizing project in which beings are increasingly subjected to calculative structures.

In an undated note, likely written in the early 1950s, Heidegger refers to a "second industrial revolution," which he glosses as "entering decision-making into the machine" (Ma and van Brakel 2014: 31). The remark anticipates a shift from machines that merely execute operations to systems into which aspects of decision-making are incorporated, thereby complicating the boundary between human judgment and technical operation.

From an ontological standpoint, this leads to a profound consequence: in a world where all beings are gestellt, set forth, as Bestand (standing-reserve), humans cannot stand "outside" technology to master it.

Heidegger expresses this clearly in an entry entitled "Technology and the Human":

To what extent an either/or, that the human either 'master' technology or technology 'enslave' the human, misses the essential questions? The 'human' and 'technology' both emerge from metaphysics; each can only apparently master the respective other, for they require [bedürfen] each other. Technology neither uses [nützt] 'the' human, nor is 'this human' 'of' technology able to free himself from it. (Mitchell 2019: 128)

Consequently, Heidegger rejects the modern illusion that humanity can fully "master" technology. On the contrary, he argues that we have never and will never be able to control and master technology, nor the technocratic essence it embodies. Technology, as a mode of revealing, fashions our very being-in-the-world, an insight that post-phenomenological and postmodern thinkers have further developed in recent decades (Botin 2022: 347). However, instead of seeing the relationship between humans and technology as a binary conflict (dominate or be dominated), Heidegger proposes a deeper approach: the co-belonging (Zusammengehörigkeit) of human and technics, a reciprocal relation in which "each party would belong to the other in a particular way" (Mitchell 2019: 129). In this relation, the concept of "control" (Steuerung), once foundational to cybernetics, no longer signifies absolute power but becomes an index of the mutual participation of different modes of being, a binding entanglement between human and machine, between Being and its self-disclosure in the technological epoch.

From a Heideggerian standpoint, AI intensifies the longstanding cybernetic tendency to model aspects of thinking as calculable operations. It does not follow that AI literally replicates Dasein or human understanding. Rather, AI systems operationalize selected capacities—such as pattern recognition, prediction, and linguistic generation—within technical procedures. Their Heideggerian significance lies in how their deployment may reinforce *Gestell* by encouraging both persons and machines to be interpreted through calculable functions. The attempt to "master" AI by purely technical means can therefore repeat the instrumental picture Heidegger criticizes; the more basic question is how AI is restructuring practices of understanding, communication, and action (Dreyfus 1992; Heidegger 1977: 4, 27).

4. Beyond *Gestell*: *Gelassenheit* and Alternative Thinking in the Ages of AI

In Heidegger's analysis, *Gestell* constitutes an extreme ontological danger because it threatens to reduce every mode of revealing to the ordering of *standing-reserve*. Yet this does not make Heidegger a simple technological pessimist. Citing Hölderlin's *Patmos*, he writes: "But where danger is, grows / The saving power also" (Heidegger 1977: 28). His claim is not that technology is straightforwardly both a danger and a saving instrument. Rather, precisely where enframing threatens to conceal revealing as such, an attentive encounter with that danger may open another relation to truth (Heidegger 1977: 28). Pitari accordingly presents this formulation as a tension to be interrogated, not as an uncomplicated promise of technological redemption (Pitari 2022: 50; see also Botin 2022).

With AI, this implies that if AI represents the new pinnacle of *Gestell*, then it also harbors within itself the possibility of opening up a new form of *aletheia*, a mode in which truth comes into unconcealment, provided that humanity attains a "proper ontological vision." Heidegger argues that:

> If the essence of technology, Enframing, is the extreme danger, and if there is truth in Hölderlin's words, then the rule of Enframing cannot exhaust itself solely in blocking all lighting-up of every revealing, all appearing of truth. Rather, precisely the essence of technology must harbor in itself the growth of the saving power. (1977: 28)

In the age of AI, this means that the solution does not lie in eliminating or exercising absolute control over AI, but in recognizing that within its very structure there remains an opening for other modes of revealing, modes that move beyond the exclusive logic of calculation and optimization.

4.1. Gelassenheit *(Releasement) in Relation to AI*

In opposition to the coercive structure of *Gestell*, Heidegger proposes *Gelassenheit* as a way of release, a form of "releasement" or "equanimity," intended to reconfigure the human relationship to reality in an alternative manner: "it refers to a disposition that blocks us from imposing our will on things and thus opens us up to alternative ways of relating to reality" (Merwin et al. 2019: 1–2).

Gelassenheit, in this sense, does not mean rejecting AI outright; rather, it entails refusing to identify AI with the essence of things or knowledge. It embodies a way of life shaped by intellectual independence from technological determination. Heidegger calls this "a comportment toward technology which expresses 'yes' and at the same time 'no': 'we let technological devices enter our daily life, and at the same

time leave them outside, that is, let them alone, as things which are nothing absolute'" (Keiling 2019: 97). Thus, *Gelassenheit* implies the capacity to live "simply," even amid an era of complex machine-learning systems, by maintaining a critical distance from them. In the context of AI, it refers to the ability to use such systems without having one's entire structure of cognition and action framed by their algorithmic logic.

Accordingly, *Gelassenheit* becomes a counterbalance to the danger posed by *Gestell* when AI begins to reshape the entire structure of our engagement with the world. It does not seek to negate AI, but rather to cultivate a "meditative attitude" through which humans learn to adopt a stance that "lets beings be in a way that is no longer mediated by human goals" (Khong 2003: 703). In the AI era, this is an invitation to sustain an *openness to the mystery* (*die Offenheit für das Geheimnis*) (Heidegger 1966: 55), an openness to those dimensions of reality that AI cannot encode. Khong immediately cautions, however, that Heidegger still grants human beings a privileged role in the disclosure of Being (2003: 703–704).

In his search for a path beyond the totalizing nature of Western technology, Heidegger also found resonance with Eastern philosophical traditions, particularly Daoism. Within this horizon, the notion of *Gelassenheit* may be placed alongside *wu wei* ("non-action"), a state in which things are allowed to follow their intrinsic course without intervention by human will (Hui 2016: 3, 101–102). In this silent correspondence between Heidegger and Daoist thought, a possibility emerges: a post-metaphysical mode of thinking in which Being is no longer dominated, but allowed to "self-disclose" in stillness and in waiting, precisely the essence of *Gelassenheit*.

Through *Gelassenheit*, Heidegger maintains that we can "step back" from calculative thinking and discover that the essence of technology is not entirely within human control. It is in this step back that another possibility of being is disclosed, where the human is no longer the subject imposing its will, but rather a being who listens attentively to the call of Being. In such a moment, we come to realize that "technology fashions our being in the world" (Botin 2022: 347), and that, for this reason, the age of AI demands a deeper mindfulness: to live *with* technology, rather than *under* it.

4.2. Seeking an "Other Thinking" and "Another Beginning" in the Age of AI

Heidegger holds that the crisis of Western thought in the age of *Gestell* demands an *other thinking* (*ein anderes Denken*), a mode of thought that could prepare the way for *another beginning* (*ein anderer Anfang*) beyond the tracks of the *metaphysics of presence*. Crucially, "he wants to do this without cybernetics" (Hui 2019: 105). This warning bears particular weight for AI: at the very moment when artificial intelligence threatens to subsume the entirety of human cognition into the operational logic of cybernetics, there is a need for a *Kehre* – a "turning" so as not to be irrevocably bound to the same mode of ordering.

To open such a beginning, Heidegger calls for a transformation (*Kehre*) in the manner in which Being discloses itself, moving beyond the oblivion of Being wrought by *Gestell* (enframing) (Lovitt 1977: xxxv). In such a comportment, the human being "gains a free relation to technology" (Botin 2022), not by controlling or mastering it, but by discerning its multilayered, non-absolute essence as one

possible mode of revealing Being, but not the only one. In the case of AI, this entails employing it while maintaining a critical distance, refusing to allow AI to become the sole measure of knowledge or the exclusive condition for the emergence of truth.

Within the depths of this critical thinking, Heidegger develops one of the most far-reaching analyses of the essence of modern technology. He approaches *Gestell* neither as a purely technical concept nor as a matter of etymology, but rather by deconstructing the tradition of Western metaphysics, primarily through a decade-long *Aus-einander-setzung* ("alter-cation") with Nietzsche (1936–1946).

What is most intriguing and conceptually fertile here is the paradox that Nietzsche, whom Heidegger regards as one of the chief agents leading to technological nihilism, is also, in Heidegger's view, among the "futural thinkers" capable of guiding humanity out of and beyond that very nihilism (Thomson 2019: 178).

Placed in the context of AI, Nietzsche and Heidegger together pose a double challenge: to expose the danger of a civilization run by the totalizing logic of technicity and calculative rationality, and at the same time to invite the search for "another beginning", one in which technology, including AI, is no longer the sole destiny of truth, but rather one among many possible paths through which Being may come into unconcealment. This demands that the human being in the age of AI master not merely the techniques of the digital but the very way in which we allow the world to appear, a philosophical task far deeper than any technological innovation.

4.3. From Téchne to Gestell *– Lessons for the AI Era*

In tracing the essence of technology (*Gestell*), Heidegger does not follow the familiar path of ethicists, sociologists, or political theorists who typically stand "outside" technology to assess it as a tool to be managed or improved. Instead, he penetrates to the ontological plane, reopening the question of the *a priori* conditions, both epistemological presuppositions and ontological presuppositions, that shape the way human beings perceive and exist in the modern world. For Heidegger, only by interrogating these foundational conditions can we truly grasp the essence of technology.

To do so, he returns to the origins of Western thought, particularly to the notion of *technē* in ancient Greek philosophy. Aristotle identifies *technē* as one of five intellectual dispositions through which the soul attains truth in affirmation or denial, alongside *epistēmē*, *phronēsis*, *sophia*, and *nous* (Aristotle 1934: 1139b15–18). Heidegger then retrieves *technē* more radically as a mode of *alētheuein*: as revealing rather than manufacturing, *technē* is a bringing-forth through which what is concealed comes into unconcealment (1977: 12–13). This distinction is essential: the fivefold classification belongs to Aristotle, whereas the interpretation of *technē* as revealing is Heidegger's phenomenological retrieval of the Greek term.

From this foundation, Heidegger poses a pivotal question: how can technology be understood as a mode of arriving at truth? This question is not directed toward truth as a collection of data or objective information, a form of truth that modern technology, especially AI, tends to optimize, but instead toward how technology configures the very structure of human existence within the world. Here, technology is no longer a neutral instrument but an "ontological configuration," a way of organizing the appearing of beings and the manner of human being in the world.

Heidegger then unfolds his philosophical project, seeking to retrace the history of Western thought to clarify the transformation of *téchne* from a mode of revealing truth into a mechanism of imposition.

This transformation reaches its apex in the concept of *Gestell*, which Heidegger uses to designate the ontological structure that governs modern technology. The shift from *téchne* to *Gestell* marks a radical change in the mode of being: from the bringing-forth of truth to the imposition of a form of truth.

The deeper cause of this lies in a misconceived ontology deeply embedded in Western philosophy, above all in the metaphysics of production. Borgmann writes: "The real, in this view, is what humans have presented, articulated, and produced. Whatever unfolds of its own accord, whether serenely or darkly, moves into oblivion" (1992: 166). What is neither produced nor controlled is no longer regarded as valuable.

From Heidegger's perspective, *productionist metaphysics* is not merely a theoretical framework for critiquing intellectual history; it is the expression of a mode of thought deeply rooted in Western ontology: the identification of the real with what can be produced, controlled, and made present according to human will. Within this framework, Being is no longer allowed to "reveal itself as it is," but is reduced to *das Brauchbare* – the useful, that which can be measured, operated, and exploited. Upon this forgotten foundation, the human becomes the "subject" and the world becomes the "object of production". It is precisely here that modern technology in the form of *Gestell* takes shape.

In the AI era, Heidegger's analysis acquires particular force. AI represents the consummation of manipulative and calculative logic, not only perpetuating but also accelerating the momentum of productionist metaphysics. All forms of knowledge, behavior, and even artistic creation are rendered programmable and translatable into algorithms. Large-scale AI models function as a new *Gestell*: harvesting data on a planetary scale, transforming it into predictive and generative models, and restructuring the world according to their own intrinsic logic of optimization. This process thickens the "veil" between human beings and the possibility for beings to "show themselves" in their own way.

Heidegger warns that "what is dangerous is not technology" (1977: 28), and, for us today, not AI per se, but the human incapacity to step back and recognize that technology, including AI, is a mode of revealing rather than truth itself (1977: 12–13). When drawn into the vortex of calculation and forgetful of the call of Being, AI will not remain a mere tool; it will become a sign of the most profound "oblivion of Being." Thus, Heidegger's lesson for the AI era is this: if we are not to allow AI to become the sole destiny of truth, we must recover the capacity to interrogate the ontological conditions upon which it rests, while at the same time opening space for other modes of revealing, modes that transcend the purely productive and optimizing logic. Only then can AI be placed in its proper position: as a powerful yet non-absolute instrument, a way in which truth may come to presence, but never the only way.

5. Conclusion

Through the philosophical lens of Martin Heidegger, AI is not merely a collection of advanced technological tools but a paradigmatic manifestation of the deeper essence of modern technology: *Gestell*. AI

not only intervenes in the material world but also reshapes the way human beings understand themselves, reality, and *Being*. Within the framework of *Gestell*, all entities, including human beings, are increasingly transformed into *Bestand*, that is, resources to be stored, calculated, exploited, and substituted for one another. The world becomes a standing reserve of ready-to-use data, in which the logic of optimization and efficiency effaces intrinsic value and uniqueness. At the same time, the expansion of AI amplifies the danger of falling into nihilism, as the meaning of beings is concealed and human beings themselves are assimilated into "functionaries" within the technological operational system. In such a world, thinking, in its most profound sense as the opening of truth, faces the risk of being supplanted by purely informational processing. The relationship between humans and technology thus ceases to be one of a controlling subject and a subordinate instrument; it becomes one of interwoven co-belonging, wherein each constitutes and shapes the other. In response to this condition, Heidegger does not advocate resisting technology through its destruction; instead, he proposes another path of thinking: *Gelassenhei*t (releasement, or letting-be). This disposition enables human beings to maintain an existential distance from technology, avoiding entanglement in the vortex of calculative thinking and instead orienting themselves toward a more open and profound mode of being. *Gelassenheit* is not the rejection of technology but a way of dwelling with it without being wholly determined by it. In this spirit, Heidegger intimates the possibility of a "free relationship" with technology, one not aimed at mastery or subjugation but grounded in recognizing the danger of enframing and the possibility that attentiveness to this danger may open other modes of revealing in the technological epoch. Heidegger's philosophy compels us to pose more profound questions about AI, not just about its technical capabilities, but also about its ontological significance for humanity and the world. It urges us to move beyond a purely instrumental mode of thought and toward a more profound meditation on Being in the age of AI.

Declaration of AI Use

ChatGPT (OpenAI) was used as a research support tool to assist with language editing, translation, and the organization of references, thereby enhancing the clarity and coherence of the manuscript.

References

Aristotle. 1934. *Nicomachean Ethics*. Translated by H. Rackham. Loeb Classical Library 73. Cambridge, MA: Harvard University Press; London: William Heinemann.

Belu, Dana S. and Andrew Feenberg. 2010. "Heidegger's Aporetic Ontology of Technology." *Inquiry* 53(1): 1–19. https://doi.org/10.1080/00201740903478376.

Boone, Mark. 2024. "Philosophical Warnings on the Use of AI in Education: Timely Advice from Plato, Martin Heidegger, Zhuangzi, and C. S. Lewis." *The Interdisciplinary Journal of Human and Social Studies* 3(2): 28–38.

Borgmann, Albert. 1992. Review of *Heidegger's Confrontation with Modernity: Technology, Politics, and Art*, by Michael E. Zimmerman. *Isis* 83(1): 166–167. https://doi.org/10.1086/356090.

Botin, Lars. 2022. "Why Heidegger Makes Sense in Contemporary Philosophy of Technology." *Foundations of Science* 27(2): 345–350. https://doi.org/10.1007/s10699-020-09755-0.

Carabantes, Manuel. 2021. "The Internet as a Heideggerian Paradigm of Modern Technology: An Argument against Mythinformation." *AI &*

Society 36(3): 695–703. https://doi.org/10.1007/s00146-021-01143-x.

Crowell, Steven. 2019. "The Challenge of Heidegger's Approach to Technology: A Phenomenological Reading." pp. 74–95 in *Heidegger on Technology*, edited by Aaron James Wendland, Christopher D. Merwin, and Christos M. Hadjioannou. London: Routledge.

Dreyfus, Hubert L. 1992. *What Computers Still Can't Do: A Critique of Artificial Reason*. Revised edition. Cambridge, MA: MIT Press.

Farin, Ingo and Jeff Malpas, eds. 2016. *Reading Heidegger's Black Notebooks 1931–1941*. Cambridge, MA: MIT Press.

Gibson, James J. 1979. *The Ecological Approach to Visual Perception*. Boston: Houghton Mifflin.

Godzinski, Ronald, Jr. 2005. "(En)Framing Heidegger's Philosophy of Technology." *Essays in Philosophy* 6(1): 115–122. https://doi.org/10.5840/eip20056120.

Heidegger, Martin. 1966. *Discourse on Thinking*. Translated by John M. Anderson and E. Hans Freund. New York: Harper & Row.

Heidegger, Martin. 1977. *The Question Concerning Technology and Other Essays*. Translated by William Lovitt. New York and London: Garland Publishing.

Heidegger, Martin. 1992. *Parmenides*. Translated by André Schuwer and Richard Rojcewicz. Bloomington and Indianapolis: Indiana University Press.

Hui, Yuk. 2016. *The Question Concerning Technology in China: An Essay in Cosmotechnics*. Falmouth: Urbanomic.

Hui, Yuk. 2019. *Recursivity and Contingency*. London: Rowman & Littlefield International.

Hui, Yuk. 2021. "On the Limit of Artificial Intelligence." *Philosophy Today* 65(2): 339–357. https://doi.org/10.5840/philtoday202149392.

Ihde, Don. 2010. *Heidegger's Technologies: Postphenomenological Perspectives*. New York: Fordham University Press.

Keiling, Tobias. 2019. "Letting Things Be for Themselves: Gelassenheit as Enabling Thinking." pp. 96–114 in *Heidegger on Technology*, edited by Aaron James Wendland, Christopher D. Merwin, and Christos M. Hadjioannou. London: Routledge.

Khong, Lynnette. 2003. "Actants and Enframing: Heidegger and Latour on Technology." *Studies in History and Philosophy of Science Part A* 34(4): 693–704. https://doi.org/10.1016/j.shpsa.2003.09.003.

Latour, Bruno. 1999. *Pandora's Hope: Essays on the Reality of Science Studies*. Cambridge, MA: Harvard University Press.

Lovitt, William. 1977. "Introduction." pp. xiii–xxxix in *The Question Concerning Technology and Other Essays*, by Martin Heidegger, translated by William Lovitt. New York and London: Garland Publishing.

Ma, Lin and Jaap van Brakel. 2014. "Heidegger's Thinking on the 'Same' of Science and Technology." *Continental Philosophy Review* 47(1): 19–43. https://doi.org/10.1007/s11007-014-9287-z.

Merwin, Christopher D., Aaron James Wendland, and Christos M. Hadjioannou. 2019. "Heidegger's Thinking through Technology." pp. 1–12 in *Heidegger on Technology*, edited by Aaron James Wendland, Christopher D. Merwin, and Christos M. Hadjioannou. London: Routledge.

Mitchell, Andrew J. 2019. "The Question Concerning the Machine: Heidegger's Technology Notebooks in the 1940s–1950s." pp. 115–132 in *Heidegger on Technology*, edited by Aaron James Wendland, Christopher D. Merwin, and Christos M. Hadjioannou. London: Routledge.

O'Brien, Mahon. 2010. "Re-Assessing the 'Affair': The Heidegger Controversy Revisited." *The Social Science Journal* 47(1): 1–20. https://doi.org/10.1016/j.soscij.2009.08.002.

Pitari, Paolo. 2022. "Martin Heidegger and Emanuele Severino: A Dispute on the Meaning of Technology." *Eternity & Contradiction: Journal of Fundamental Ontology* 4(6): 44–70. https://doi.org/10.7346/e&c-062022-04.

Thomson, Iain D. 2005. *Heidegger on Ontotheology: Technology and the Politics of Education*. Cambridge: Cambridge University

Press. https://doi.org/10.1017/CBO9780511499210.

Thomson, Iain D. 2019. "Technology, Ontotheology, Education." pp. 174–193 in *Heidegger on Technology*, edited by Aaron James Wendland, Christopher D. Merwin, and Christos M. Hadjioannou. London: Routledge.

Thomson, Iain D. 2025. *Heidegger on Technology's Danger and Promise in the Age of AI*. Elements in the Philosophy of Martin Heidegger. Cambridge: Cambridge University Press. https://doi.org/10.1017/9781009629423.

Van Mazijk, Corijn. 2019. "Heidegger and Husserl on the Technological-Scientific Worldview." *Human Studies* 42(4): 519–541. https://doi.org/10.1007/s10746-019-09526-2.

Wendland, Aaron James. 2019. "Heidegger's New Beginning: History, Technology, and National Socialism." pp. 149–173 in *Heidegger on Technology*, edited by Aaron James Wendland, Christopher D. Merwin, and Christos M. Hadjioannou. London: Routledge.

Winkler, Rafael. 2019. "Naturalizing Gestell?" pp. 314–333 in *Heidegger on Technology*, edited by Aaron James Wendland, Christopher D. Merwin, and Christos M. Hadjioannou. London: Routledge.

Wolin, Richard, ed. 1993. *The Heidegger Controversy: A Critical Reader*. Cambridge, MA: MIT Press.

Woods, Dwayne. 2025. "Optimizing beyond Optimization: Heideggerian Limits and Artificial Intelligence." *AI and Ethics* 5: 3143–3157. https://doi.org/10.1007/s43681-024-00607-2.