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Can Technological Artifacts Become Moral Agents?

—A Reconstructive Inquiry Based on Verbeek's Theory of Technological Mediation

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Abstract

Traditional approaches in the ethics of technology, grounded in a humanist subject-object dichotomy, typically regard technology as a morally neutral, instrumental entity. In contrast, Peter-Paul Verbeek, drawing on the theory of technological mediation, offers a relational reconstruction of the concepts of intentionality and freedom. Intentionality is no longer understood as an exclusive property of human consciousness, but as a relationally distributed structure of directedness emerging within the human-technology-world nexus. Likewise, freedom is not conceived as a transcendental capacity to escape all external influences, but as a reflective and creative practice enacted within technologically mediated contexts. Accordingly, the moral subject can no longer be treated as a pre-given starting point of ethical analysis; rather, it is constituted within a network of mutual mediation between humans and technological artifacts.

Keywords

Technological Mediation, Intentionality, Freedom, Moral Agency, Postphenomenology

1. Introduction

When expectant parents first "see" the face, heartbeat, and bodily structure of a fetus through prenatal ultrasound imaging, they enter a morally charged situation that is deeply mediated by technology. What appears on the screen is not merely biological data—such as nuchal translucency measurements, indicators of organ

development, or risk assessment metrics. Rather than constituting a "neutral" gaze into the womb, the image embodies a normative expectation of what it means to be "responsible parents". Is the fetus healthy and intact? Should further tests be conducted? Should certain abnormalities lead to decisions about the continuation of the pregnancy? These moral decisions do not arise solely within an autonomous human subject; instead, they emerge within a newly configured space of moral perception co-constituted by humans and technological artifacts under the mediation of ultrasound technology.

This commonplace medical scenario exposes a difficulty that traditional ethical frameworks struggle to accommodate: is technology merely a neutral tool employed by human beings, or does it, in a more fundamental sense, participate in the very constitution of moral subjectivity?

2. The Non-Humanist Turn in the Ethics of Technology

The two dominant traditions in modern normative ethics—deontology, represented by Immanuel Kant, and consequentialism, associated with Jeremy Bentham and John Stuart Mill—differ significantly in their evaluative criteria, yet share a common underlying assumption: the moral subject is a human individual who exists prior to practice and possesses the capacities for rational reflection and free choice. Within this humanist framework, technology is either regarded as a value-neutral instrument employed by the subject or as an external force that threatens human autonomy. As a result, technology is systematically excluded from discussions of moral agency. However, the case of ultrasound imaging demonstrates that technology is far from a silent prop on the moral stage. By reshaping the ontological status of the fetus, prefiguring its identity as a "potential patient", and reconfiguring the moral roles of parents, technology actively participates in the constitution of moral situations and the formation of moral subjects. When technology is not merely used, but subtly mediates perception, prestructures choices, and even contributes to our self-understanding as moral agents, it becomes increasingly untenable to classify it simply as a morally neutral object.

The non-humanist turn in the ethics of technology emerges as a response to this theoretical impasse. This shift is not arbitrary, but is grounded in a critical reexamination of the humanist assumptions underlying modernity. Peter Sloterdijk, through the metaphor of the "human zoo", argues that the traditional humanist project of "taming" humanity through textual culture has lost its efficacy, giving way to forms of "anthropotechnics" that directly shape human beings at the material and bodily level (Sloterdijk, 2009). This perspective redirects ethical attention from language and texts to the material mediating power of technological artifacts. Similarly, Bruno Latour dismantles the ontological foundations of humanism by critiquing the modern practice of "purification", showing that humans and non-humans, subjects and objects, have never been truly separate but have always existed within hybrid networks (Latour, 2012). Together, these critiques point toward a shared conclusion: to adequately understand moral practice in a

technological age, ethics must abandon the presupposition of an isolated human subject and instead recognize the constitutive role of technological artifacts in moral situations.

Against this theoretical background, the Dutch philosopher of technology Peter-Paul Verbeek develops the theory of technological mediation, systematically advancing this non-humanist turn. Verbeek's central insight is that technological artifacts are not passive tools awaiting human use; rather, they actively mediate the relationship between humans and the world, thereby participating in both moral action and the formation of moral subjectivity. This paper aims to provide a systematic philosophical argument for this shift.

With regard to the criteria for defining moral agency, the scholarly literature exhibits several distinct lines of debate. Within the dominant traditions of ethics and philosophy of mind, intentionality and freedom are typically regarded as indispensable internal properties of a moral agent. Kenneth Einar Himma summarizes the necessary conditions for moral agency as follows: "X can be considered a moral agent if and only if X possesses the following capacities: 1) X is an agent; 2) X has the capacity for free choice; 3) X has the capacity to deliberate about what it ought to do; and 4) X has the capacity, under normal conditions, to correctly understand and apply moral rules." (Himma, 2009) This view has been widely endorsed in the academic community. Peter-Paul Verbeek likewise follows this line of reasoning. By reconstructing the two foundational pillars of moral agency—intentionality and freedom—from a postphenomenological perspective, it demonstrates how technology contributes to the conditions of possibility for moral action. Moral agency, on this view, is not an intrinsic property exclusively possessed by human subjects, but a practice-based structure that is distributed and generated within human-technology relations. This reconceptualization opens up a new theoretical space for understanding moral practice in a technological age.

Before proceeding with the substantive argument, it is necessary to delimit the boundary conditions of the present inquiry. The notion of "technological artifacts" encompasses an extremely broad range—from a hammer to a prenatal ultrasound system to social media recommendation algorithms—and these artifacts relate to human practices in markedly different ways. Not all technological artifacts participate in the constitution of moral situations with the same intensity or in the same manner; accordingly, the applicability of the concept of moral agency is not uniformly distributed across them.

Drawing on Peter-Paul Verbeek's distinction regarding degrees of technological mediation, technological artifacts can be provisionally classified into three types. First, there are simple tools (e.g., hammers, utensils), whose mediating role is relatively weak and highly dependent on the user's immediate intentions. Second, there are strongly mediating artifacts (such as the prenatal ultrasound system examined throughout this paper), which materially participate in the reconfiguration of perceptual frameworks, the delimitation of possible courses of action, and the shaping of subjects' self-understanding. Third, there are algorithmic sys-

tems and intelligent environments, which not only mediate the relation between humans and the world but also exhibit a higher degree of "behavioral autonomy" through real-time feedback and autonomous decision-making capacities.

Accordingly, the claim advanced in this paper—that technological artifacts can become moral agents—should not be construed as an unqualified animistic assertion. Rather, it refers specifically to those cases in which, within relatively stable human-technology relations of mediation, technological materiality participates in the constitution of moral situations and the formation of moral subjects.

3. The Reconstruction of Intentionality: From Inner Consciousness to Human-Technology Distribution

To argue for the moral agency of technological artifacts, one must first confront a central philosophical concept: intentionality. According to the traditional view, only beings endowed with consciousness can possess intentional states—such as beliefs and desires—and thus qualify as genuine "subjects". If this criterion were taken as unassailable, technological artifacts would be permanently excluded from discussions of moral agency. However, the postphenomenological theory of technological mediation challenges this assumption by demonstrating that intentionality is not the exclusive domain of human consciousness, but rather a relational form of directedness that is reconfigured within the associative structure between humans and technology. This section traces the conceptual development from classical theories of intentionality to Peter-Paul Verbeek's account of technologically mediated intentionality, in order to show how technological artifacts play a constitutive role in the generation of moral agency.

The concept of intentionality was first introduced into modern philosophy by Franz Brentano as the defining feature of mental phenomena: consciousness is always consciousness of something. Edmund Husserl systematized this idea as the central category of phenomenology, arguing that consciousness is always directed toward an object, manifesting a unity between "intentional acts" and their "intentional correlates". In his later work, Husserl introduced the notion of passivity, suggesting that objects can also actively affect the subject—an insight that provides an important clue for understanding the agency of technological artifacts. Martin Heidegger subsequently shifted the discussion of intentionality from the philosophy of consciousness to ontology, interpreting it as the practical orientation of being-in-the-world, in which human beings relate to the world through the use of equipment and the undertaking of tasks. Maurice Merleau-Ponty further expanded intentionality into the domain of embodied experience through the notion of "operative intentionality", emphasizing the practical interaction between bodily action and the world. This trajectory of transformation lays the theoretical groundwork for the concept of "technological intentionality". Technology is no longer understood as a neutral instrument; rather, it mediates the relationship between humans and the world, thereby reconfiguring both perception and action.

3.1. Don Ihde's "Technological Intentionality": A Postphenomenological Extension

Within the development of postphenomenology, Don Ihde was among the first to introduce the concept of intentionality into the philosophy of technology. He proposed the notion of "technological intentionality" to account for the directional role that technological artifacts play in shaping the relationship between humans and the world. This concept can be understood along three interrelated dimensions.

First, technological intentionality involves a structural directedness toward specific aspects of reality (Han, 2012). This directedness does not imply that technologies possess subjective intentions in the human sense; rather, it refers to the way in which technologies, through their structures, functions, and design logics, preconfigure selective modes of reference and disclosure. In this sense, technologies exhibit a structured capacity to orient attention by functionally selecting and foregrounding particular features of the world. For example, knives are designed for cutting, slicing, or carving objects; they are almost invariably used for these purposes rather than as fuel or toys. Through such directedness, technology becomes an important medium for extending, transforming, and reconfiguring human perception and practice.

Second, technological artifacts embody specific tendencies or trajectories that guide human action. In the process of use, individuals are steered by the particular modes of engagement that technologies afford. Ihde emphasizes that technologies provide frameworks for action, thereby shaping both intentionality and inclination. Once a technology is designed, configured, and normalized in practice, it implicitly prescribes certain patterns of use while excluding alternative possibilities. A typical example is the shift from paper maps to GPS navigation systems. While GPS applications greatly enhance convenience and accuracy, they also diminish users' sense of overall spatial orientation and weaken environmental awareness, often leading to forms of dependency. Although the ultimate goal of navigation remains unchanged, different technologies impose varying demands on users, reflecting distinct forms of technological "inclination".

Third, technological intentionality is fundamentally mediating or technologically mediated intentionality. From an ontological perspective, technology exists within the relation between humans and the world, actively mediating perception and interpretation. When human beings see, hear, judge, and act through technological means, the structure of the human-world relation is no longer a direct subject-object interaction; instead, it becomes a technologically mediated relation in which technology occupies an intermediary position. In this configuration, human intentionality does not disappear but is reconstituted through technological mediation. Technological intentionality thus manifests only within concrete practical contexts, where it participates in the co-constitution of subjectivity and objectivity.

3.2. Peter-Paul Verbeek's Development: Hybrid and Composite Intentionality

Building upon Don Ihde's account, Verbeek further develops the concept of intentionality by interpreting technological mediation as a specific, material form of intentionality. He argues that intentionality must be understood within the interplay between human intentionality and technological intentionality, and within concrete contexts of application. Technological artifacts do not possess self-sufficient intentionality independent of human beings; without the support of human intentionality, their directedness cannot be realized. Only within the relational nexus between humans and reality can technological artifacts exercise their mediating role. At the same time, however, they cannot be reduced to mere "extensions" of human intentionality. Rather, technological intentionality exists precisely within the practical relations constituted by humans and technologies. On this basis, Verbeek introduces the concepts of cyborg intentionality (or hybrid intentionality) and composite intentionality.

Cyborg intentionality arises from the integration of technological artifacts with the human body. In cases such as implanted pacemakers, invasive brain-computer interface electrodes, or the use of antidepressant medication, technological artifacts become incorporated into the user's engagement with the world, thereby giving rise to a new kind of entity. In such situations, intentionality is no longer merely the result of technology mediating between humans and the world at an embodied level; rather, it emerges from a newly constituted physical unity that transcends the traditional embodied relation. It becomes difficult to disentangle the respective contributions of human and technology in this mediating process, as intentionality ultimately takes on a hybrid form directed toward the world. The example of antidepressant drugs illustrates this point. Once integrated into the subject's physiological processes, such substances directly intervene in neurochemical mechanisms, thereby altering the affective structure of experience and reshaping the subject's capacity to relate to the world. The resulting intentionality is neither solely the product of the human subject nor entirely determined by the drug; instead, it is co-constituted within a hybrid system in which human and technological elements are inseparably intertwined.

Composite intentionality arises within what Peter-Paul Verbeek terms a "composite relation", in which "the intentionality or directedness of technological artifacts themselves plays a crucial role, as it interacts with the intentions of the human users of these artifacts" (Verbeek, 2011). In such cases, the intentionality inherent in technological artifacts combines with the intentionality of human users, giving rise to a form of composite intentionality that reflects both technological directedness and purposiveness. A commonly cited example is that of recording devices. In complex environments such as conferences, audio recordings typically capture not only the primary speech that listeners intend to hear, but also background noise and ambient sounds. This differs significantly from human auditory experience in situ, where individuals selectively focus their attention on the

speaker while filtering out distractions. Recording devices, by contrast, register all sounds indiscriminately. This contrast illustrates the difference between human intentionality, which is selective and context-sensitive, and technological intentionality, which operates according to its own non-selective mode of registration.

Verbeek further distinguishes between two fundamental forms of composite intentionality: amplifying intentionality and constitutive intentionality. Amplifying intentionality refers to the ways in which technology magnifies pre-existing human intentional capacities through processes such as intensification, extension, or mechanization. In doing so, it renders perceptible certain aspects of reality that would otherwise remain inaccessible to direct human experience. By contrast, constitutive intentionality does not aim to disclose a pre-existing reality. Instead, it generates a new form of reality—one that does not exist within natural experience but acquires practical efficacy through technological mediation.

Ultrasound technology vividly exemplifies these two modalities. On the one hand, ultrasonographic imaging exhibits a form of amplifying intentionality: it renders bodily structures that are otherwise impenetrable to human vision into visible images, thereby making the fetus—originally situated within the pregnant body—perceptually accessible. Physicians are thus able to "see" the ventricular structure of the fetal heart, an intentional directedness that unaided vision could never achieve.

On the other hand, ultrasonographic imaging also demonstrates constitutive intentionality. The fetal image displayed on the screen is not a neutral, pre-existing fact awaiting discovery; rather, it is a particular version of reality constructed through the joint operation of ultrasound technology and the medical epistemic framework. Through imaging practices, ultrasound constitutes the fetus as an "assessable medical object". Within this technologically constructed reality, the fetus is represented in terms of a series of biometric parameters—biparietal diameter, femur length, amniotic fluid index, and nuchal translucency thickness. These parameters do not exist within the horizon of ordinary perception, yet within the practical context of prenatal examination they acquire decisive ontological and normative force: they are directly correlated with medical judgments of "normality/abnormality" and, in turn, trigger a series of subsequent clinical decisions.

These analyses collectively demonstrate that intentionality cannot be ascribed exclusively either to human beings or to technological artifacts; rather, it is distributed across the relational nexus of human-technology-world. Technology is neither a neutral instrument nor a subject endowed with a mind. Instead, through its specific structures of intentionality, it participates in the constitution of experience, action, and even reality itself. The intentionality of technological artifacts is thus inherently relational and context-dependent. It can only manifest and exert its mediating effects in conjunction with human intentionality and within concrete practical situations. Detached from human experience and action, technological artifacts cannot independently direct themselves toward the world. At the same time, technological intentionality cannot be reduced either to the intentions

of designers or to the subjective intentions of users. In concrete contexts of use, technologies often intervene in human perception and action in unforeseen ways, reshaping the horizon of possible actions and thereby co-constituting specific moral situations.

In this sense, intentionality can no longer be understood as an exclusive attribute of the human subject; rather, it is reconceived as a relational form of directedness distributed across the human-technology nexus. This reconceptualization establishes the first conceptual foundation for understanding the moral role of technological artifacts.

4. The Reconstruction of Freedom: From Transcendental Autonomy to Relational Practice

If intentionality constitutes the "directional" dimension of moral agency, then freedom constitutes its "autonomous" dimension. In a context where modern technologies are deeply embedded in the lifeworld, freedom can no longer be treated as an abstract concept of the kind traditionally discussed in the history of philosophy; rather, it has become an ethical issue intrinsically entangled with technological practices. Technology not only shapes the conditions of possibility for human action, but also mediates the very meaning of freedom through affordances, inducements, and forms of mediation. Against this background, scholars have begun to reconsider the philosophical meaning of freedom: does freedom consist in escaping technological influence and preserving a pure and absolute form of subjectivity? Or should it instead be reinterpreted in terms of how technology shapes subjectivity and the space of action? Building upon a critical engagement with traditional conceptions of freedom, Peter-Paul Verbeek develops a new understanding of freedom within the framework of technological mediation. To fully grasp the distinctiveness of Verbeek's account, it is necessary to situate it within the broader philosophical tradition of theories of freedom—most notably those developed by Immanuel Kant, Isaiah Berlin, and Michel Foucault, whose respective approaches provide essential conceptual resources for his analysis.

4.1. Immanuel Kant's Transcendental Autonomy and Its Predicament in the Technological Age

In Kant's moral philosophy, freedom serves both as the starting point of practical reason and as the transcendental condition of the moral law. Autonomy, in this context, does not refer to mere arbitrariness in action or the freedom of choice in a general sense; rather, it denotes the capacity of rational agents to legislate universal moral laws for themselves. In other words, freedom is not the absence of all constraints, but precisely the condition in which the will is governed solely by laws it gives to itself through reason. It is in virtue of this capacity that the subject qualifies as a moral subject: as a rational being, it is able to both obey and generate the moral law in practice, rather than being determined by natural impulses, empiri-

cal desires, or external authorities.

At the metaphysical level, freedom in Kant's philosophy is a transcendental structure rather than an empirical object. In the Critique of Pure Reason, he formulates the antinomy of freedom to argue that if all actions were determined solely by natural causality, then responsibility and moral evaluation would be impossible. It is therefore necessary to posit a form of causality of freedom beyond the phenomenal realm. Freedom attains practical reality through the unconditional command of the moral law, and the two stand in a relation of mutual presupposition.

At the practical level, freedom manifests as the autonomy of the will, whereby the subject detaches itself from sensuous inclinations and acts solely on the basis of universal rational laws. Heteronomy—action motivated by considerations such as happiness, utility, or authority—lacks genuine moral worth. Any external influences, including social norms, institutional constraints, or technological conditions, are thus liable to be seen as potential threats to freedom. In Kant's framework, freedom represents an ideal of purity: the subject must remain independent of external determinants in order to legislate for itself.

However, Kant presupposes that the subject can maintain pure rational autonomy independently of concrete contexts, without adequately explaining how the will and action are actually formed within the empirical world. In a lifeworld where modern technologies are deeply embedded, human perception, cognition, and action are continuously shaped by technological mediation. If one adheres strictly to Kant's internal conditions of freedom, technological artifacts would not only be excluded from qualifying as moral agents, but would also be excluded from the very discussion of moral agency.

As Peter-Paul Verbeek argues, there is no longer any "pure" subject in the contemporary technological world. The subject is always situated within a network of practices constituted through technological mediation, where both capacities for action and structures of responsibility take shape. Consequently, the concept of freedom must undergo a structural reinterpretation: it must shift from being understood as a transcendental attribute independent of the world to a practical capacity realized and enacted within concrete technological conditions.

4.2. Isaiah Berlin's Negative and Positive Liberty

Isaiah Berlin's account of freedom constitutes one of the most influential contributions to twentieth-century political philosophy. He famously distinguishes between two concepts of liberty: negative liberty and positive liberty. Negative liberty addresses the question: What is the area within which a person is or should be left free to do or be what they are able to do or be, without interference from others? (Berlin, 2002) It can be broadly understood as freedom from interference—that is, the absence of external constraints, coercion, or intervention. This conception of liberty is primarily concerned with the availability of opportunities for action, rather than with the capacity to act. Positive liberty, by contrast, ad-

dresses the question: What or who is the source of control or interference that determines someone to act in a particular way or to be a certain kind of person (Berlin, 2002). It is commonly understood as freedom to act—the freedom to be one's own master. In this sense, it refers to the capacity for self-direction, rational self-governance, and the realization of one's own purposes.

Conventional critiques of technology typically adopt the perspective of negative liberty, emphasizing that technological influences can be coercive or manipulative, thereby constraining the space within which individuals are free to choose. For instance, algorithmically generated "filter bubbles" and the growing dependence on smartphones are often cited as limiting users' exposure to diverse information and diminishing offline social engagement. In contrast, techno-optimist positions tend to highlight the ways in which technology expands human capabilities, thereby enlarging the domain of positive liberty. From this perspective, technological systems enhance individuals' capacities for action, self-realization, and goal attainment. Berlin's distinction between negative and positive liberty thus provides an important conceptual backdrop for Peter-Paul Verbeek's reconfiguration of the concept of freedom. Verbeek critically distances himself both from technological pessimism, which overemphasizes threats to negative liberty, and from overly optimistic accounts that equate technological enhancement with an unproblematic expansion of positive liberty. According to Verbeek, human freedom in everyday life is always already shaped and constrained by a variety of factors, including legal regulations, institutional structures, and social norms. Yet such constraints are rarely experienced as a loss of freedom in any absolute sense. The crucial issue, therefore, is not whether human action is subject to external influences, but how freedom can be enacted within—and through—these conditions of influence.

4.3. Michel Foucault's Insight: Freedom as a Practice of Technologies of the Self

Although Michel Foucault is not traditionally classified as a theorist of technology ethics, his work has had a profound influence on the field. His early studies focus on the analysis of knowledge and power structures, whereas his later work turns toward ethics, examining how human beings constitute themselves as moral subjects within these structures of power. In this framework, human beings are not merely passive objects subjected to power; rather, they actively participate in shaping their own subjectivity through ongoing engagement with power relations in concrete social practices. Subjectivity, therefore, is not a pre-given essence but an ongoing process of formation. According to Peter-Paul Verbeek, Foucault's analysis of power offers valuable resources for understanding technological mediation. Technologies, by shaping perception and action, operate as materialized forms of power that discipline, regulate, and normalize subjects. In this sense, technological artifacts do not merely constrain or enable action from the outside; they actively participate in structuring the conditions under which subjects come to act and

understand themselves.

The concept of freedom occupies a central place in Michel Foucault's later thought and serves as a crucial hinge in his shift from the analysis of power to the domain of ethics. While Foucault's work consistently investigates how human beings are shaped by power relations, his later writings increasingly focus on how individuals actively constitute themselves as subjects within these relations—a process he conceptualizes as subjectivation. According to Peter-Paul Verbeek, a key insight of Foucault's relevance for technology ethics lies in the possibility of establishing a "free relation" to technology. Such a relation enables subjects to engage with the ways in which technological mediation shapes their subjectivity, and to actively stylize these formative influences. In this sense, freedom must be analyzed in relation to power, rather than in opposition to it. Human subjectivity emerges through an active engagement with power relations, not through their negation or transcendence (Verbeek, 2011). Freedom thus becomes a form of practice—a way of interacting with power—rather than an abstract state to be achieved within or beyond institutional constraints. It is not a mediating condition situated between domination and autonomy, but an ongoing activity through which individuals reflect upon, shape, and stylize their own modes of existence within networks of power (Verbeek, 2011). Accordingly, for Foucault, freedom is neither a transcendental endowment nor a context-independent capacity, nor is it a state of pure autonomy detached from power relations. Rather, it is a practical relation in which subjects continuously constitute themselves through reflection, transformation, and stylization within a field of power interactions. Freedom does not stand opposed to power; instead, it is generated and continually reconfigured within the very networks of power in which subjects are embedded.

First, Michel Foucault's understanding of freedom must be situated in relation to his critique of "autonomy". Traditional ethical theories define autonomy in terms of the self-legislation of the will and ground moral agency in the subject's capacity for pure rationality and self-governance. Accordingly, conventional approaches in technology ethics often frame technology as a potential threat to human autonomy, emphasizing the risk that technological systems may undermine the subject's independence. Foucault, however, regards this conception as lacking in realism. The human subject does not exist in a space external to power; rather, it is always constituted through the operation of power relations. Importantly, Foucault does not conceive of power as merely repressive. Instead, power is understood as a ubiquitous and productive force that generates possible forms of subjectivity through institutions, bodies of knowledge, and material arrangements—including technological artifacts. Within this framework, freedom can no longer be understood as liberation from external forces, nor as the opposite of power. Rather, it takes the form of an active engagement with these forces, through which individuals come to exercise a reflective and practical grasp over their own modes of existence. Freedom thus consists in the capacity to respond to, modulate, and actively stylize the shaping effects of power in the constitution

of subjectivity.

Second, Michel Foucault's understanding of freedom is also deeply informed by the ancient Greek tradition of the technologies of the self. In this tradition, ethics is not centered on obligations or rules, but on practices of self-formation and stylization. The subject seeks to cultivate a mode of existence that maintains a reflective distance from desires, emotions, and external forces, thereby shaping life as a coherent "style" or "form". Such stylization constitutes an expression of freedom.

In this context, freedom is understood as an active and aesthetic practice of subject-formation, rather than as the result of conforming to norms or escaping constraints. Freedom thus functions as both the condition for ethical practice—enabling processes of subjectivation—and as its telos, insofar as the subject seeks to attain a certain mode of being within a field of power relations. The subject's freedom does not consist in liberation from power, but in the capacity to constitute itself through a critical and reflective engagement with power. It is precisely through this ongoing interaction that individuals shape their subjectivity (Verbeek, 2011). Peter-Paul Verbeek endorses this Foucauldian conception of freedom and extends it into the domain of technology ethics. For Verbeek, freedom in a technological age does not consist in emancipation from technological influence, but in the capacity to participate, in a reflective and creative manner, in the formation of subjectivity under conditions of technological mediation. Within this framework, the moral subject is no longer a transcendental and technology-independent entity, but a hybrid being that emerges through ongoing interactions with technological artifacts.

A crucial point is that Michel Foucault overcomes the structural opposition between humans and technology that characterizes much of modern ethical theory. Within the traditional ethical framework, morality is treated as an exclusively human domain, while technology is regarded as an external factor—either as a neutral instrument of human purposes or as a threat to human autonomy. Foucault, by contrast, understands technological artifacts not as elements that undermine subjectivity, but as integral components in its constitution. Technology is therefore not something to be guarded against in ethical reflection, but rather one of the forces that actively participates in the formation of moral agents. On this view, moral agency is located within human-technology hybrids, and freedom itself acquires a similarly hybrid structure. In this sense, Foucault's conception of freedom becomes a pivotal element in Peter-Paul Verbeek's theory of technological mediation. The moral subject is no longer understood as an autonomous entity external to technology, but as an open-ended structure that continuously takes shape through processes of technological mediation. Technology, accordingly, is no longer framed as a threat, but as a medium and resource for moral practice. Freedom, in turn, is no longer defined as the absence of technological influence, but as the capacity of subjects to participate creatively in their own formation within technologically mediated contexts.

4.4. Peter-Paul Verbeek's Synthesis: Relational Freedom and Technological Mediation

Drawing on the insights of Immanuel Kant, Isaiah Berlin, and Michel Foucault, Peter-Paul Verbeek develops the notion of relational freedom within the framework of technological mediation, in order to address the problem of freedom in a technological age. Technological artifacts are deeply embedded in structures of action: they mediate perception, shape practices, and discipline behavior. As a result, human decision-making can no longer be understood as the outcome of an isolated subject's will, but rather as something that emerges through continuous interaction with materialized forces. Under such conditions, the traditional concept of freedom—centered on inner autonomy—becomes insufficient for describing actual human practices. Verbeek therefore reconceptualizes freedom, constructing a new framework for moral agency under technological mediation. Importantly, this approach does not attribute freedom to technological artifacts themselves, but incorporates their mediating role into the very concept of freedom.

First, if judged by classical theories of freedom, technological artifacts clearly do not possess freedom. However, everyday life is pervasively mediated by technology, which plays a constitutive role in moral decision-making. This makes it difficult to uphold freedom as an absolute criterion for moral agency. Notably, a certain degree of freedom is sufficient for the attribution of moral responsibility; freedom need not be total or absolute. Therefore, the meaning of "freedom" itself requires reconstruction in the technological era.

Second, Verbeek questions the attainability of absolute freedom. Neither Kantian autonomy nor other major theories of freedom genuinely presuppose a form of freedom entirely detached from all forms of influence. Human subjects are always situated within multiple structures—legal, institutional, cultural, bodily, and technological—and freedom unfolds through interaction with these conditions. In practice, legal rules and social norms constrain action, yet they are rarely regarded as mere restrictions, since they often enhance security and enable broader forms of freedom. Moral agency, therefore, does not require absolute freedom but can be realized within structures of technological mediation.

Third, the notion of pre-reflective technological mediation opens up a new understanding of freedom. "Pre-reflective" refers to the level of experience and action that precedes explicit reflection. Technological mediation does not primarily guide action at the level of conscious deliberation; rather, it shapes the field of meaning in which subjects are already situated prior to moral judgment. Consider the example of speed bumps: drivers slow down not necessarily as a result of moral reasoning, but due to the direct shaping of bodily behavior by road infrastructure. In medical contexts, ultrasound imaging constitutes the body as "visible" and "assessable" prior to reflection, thereby pre-structuring moral decisions. If technological mediation always operates prior to reflection, then defining freedom as independence from all external influences becomes untenable. Freedom must in-

stead be understood as the capacity of subjects to respond to, adjust, and reflect upon these mediations within the situations in which they are embedded.

Fourth, Verbeek argues that freedom is not the absence of influence, but a practice of engaging with inevitable influences. Pre-reflective technological mediation does not eliminate freedom or moral responsibility; rather, it transforms the way in which they are realized. Subjects remain capable of reflection, choice, and responsibility, but these capacities are always exercised within technologically shaped fields of practice. This explains why technological artifacts, although lacking reflexivity and free will, can nonetheless participate in the constitution of moral agency: by pre-reflectively configuring moral situations, they help shape the conditions under which action becomes possible.

Fifth, paralleling the distributed nature of intentionality across humans and technologies, Verbeek understands freedom as a distributed phenomenon. Freedom cannot be located solely within technological artifacts, nor can it be reduced to an intrinsic property of human subjects; rather, it should be conceived as a structural outcome distributed across human-technology relations. Under conditions of technological mediation, material configurations do not necessarily diminish freedom; on the contrary, they can generate new possibilities for action and expand the space of freedom. Technology, by shaping material environments, actively constitutes the conditions under which freedom can be exercised. The relational nexus between humans and technologies thus becomes the very site in which freedom is inhabited and enacted. This is precisely what Verbeek conceptualizes as relational freedom.

Relational freedom denotes that freedom exists within the relations co-constituted by humans and technologies. It enables us to move beyond polarized attitudes toward technology—neither uncritically embracing it nor wholly rejecting it—but instead to establish, evaluate, and actively engage with human-technology relations. In this sense, freedom is no longer understood as a transcendental precondition of moral agency; rather, it becomes the possibility for technological users to relate to and negotiate the various influences that shape their actions. Consider the example of a driver approaching an unsignalized intersection. Whether the driver yields to pedestrians is not determined solely by individual judgment, but also by road infrastructure, surveillance systems, and driver-assistance technologies. Action thus emerges as the result of a co-shaping process between human deliberation and technological mediation: it is both conditioned by external influences and yet retains the capacity for reflection and choice.

At this point, Verbeek's conception of freedom resonates with that of Michel Foucault: freedom does not consist in escaping all forces that shape the subject, but in the subject's capacity to establish a reflective relation with these forces. If a given technology were to fully determine human behavior—rendering individuals incapable of adapting to or modifying its influence, and thereby obstructing the formation of moral subjectivity—then it ought to be subjected to critical scrutiny and evaluated in terms of its democratic legitimacy. Significant technologies

should not hinder the possibility of self-formation; rather, they should provide the conditions under which individuals can pursue a good life. Technological intervention in moral judgment, at the material level, should not be understood as a contamination of pure reason. Instead, it constitutes a new mode of mediation and regulation of ethical life in a technologically saturated society. Freedom, in this sense, lies in shaping an appropriate relation with technology. The central question is no longer whether human action is influenced by technology, but what kind of mediated subject one ought to become.

Therefore, the form of freedom required for moral agency is neither Kantian transcendental autonomy nor Berlinian negative or positive freedom defined in opposition to external influence. Rather, it is a form of relational or practical freedom: the capacity of subjects, within concretely lived situations already mediated by technology, to reflect upon, respond to, negotiate, and even creatively transform these mediating forces. The moral subject is thus no longer a fragile inner core that must be shielded from technological interference, but an open-ended process in which autonomy is continuously generated and sustained through ongoing interaction with non-human forces. Technology, accordingly, ceases to be an external threat to freedom; instead, it becomes the very field and partner through which the practice of freedom is made possible.

Peter-Paul Verbeek's concept of relational freedom has, in recent years, been further extended and refined. Oie (2023) argues that, although Verbeek's account aptly captures the practical dimension of freedom under conditions of technological mediation, it still requires further development toward the notion of personal autonomy in order to more adequately address the challenges to autonomy arising in contexts of deep technological embeddedness (Oie, 2023). Oie's work indicates that the problem of freedom in the technological age continues to generate sustained scholarly attention, with Verbeek's framework serving as a central point of departure for these discussions.

At this point, we have completed a postphenomenological reconstruction of the two fundamental pillars of moral agency—intentionality and freedom. Intentionality has been reinterpreted as a relational directedness distributed across the network of human-technology-world relations, while freedom has been reconceived as a relational practice unfolding within contexts of technological mediation. This conceptual reconfiguration fundamentally challenges the traditional view that equates moral agency with an isolated human subject, thereby removing the principal conceptual obstacles to understanding the moral role of technological artifacts.

5. The Relational Constitution of the Moral Subject

Intentionality and freedom have now been reinterpreted as relational concepts distributed across human-technology networks. However, if the argument were to stop at this point, it would still risk presupposing an unexamined assumption: namely, that there exists a pre-given human subject, prior to or external to tech-

nological mediation, awaiting the attribution of intentionality and freedom. This section completes the final step of the argument by demonstrating that the moral subject itself is not a pre-existing foundation of moral practice, but rather the outcome of a relational process constituted through technological mediation. Technology not only influences how subjects make decisions; it also participates in shaping the very mode of being through which subjects exist as moral agents.

5.1. Paradigm Shift: From the Given Subject to the Constituted Subject

Mainstream ethical theories typically presuppose the existence of a moral subject endowed with inherent capacities such as rationality, self-consciousness, and free will. Thess subject functions both as the starting point of ethical analysis and as the ultimate bearer of moral responsibility. Moral problems are thus framed in terms of what rules this pre-given subject ought to follow (as in deontological ethics) or what consequences it ought to pursue (as in consequentialist ethics). Within this framework, technology is either regarded as a value-neutral tool employed by the subject or as an external factor that interferes with the subject's purity. In either case, technology is systematically excluded from the constitution of the moral subject itself.

From Verbeek's perspective, if the ethics of technology is to adequately address moral issues in contemporary technological culture, it must undergo a fundamental theoretical shift: the moral subject should no longer be conceived as a pre-given entity, but as the outcome of a process that is gradually constituted within concrete practices. Within this shift, the central question is no longer whether technology can replace humans as moral agents, but how technology participates in shaping the very structure of subjectivity—namely, who can act, how they can act, and why they act. Verbeek argues that one of the key methodological tasks of technological ethics is to analyze the role technologies play in the process through which humans are constituted as moral subjects. Accordingly, the focus of ethical inquiry should move away from asking whether a subject possesses certain moral properties, and toward examining how subjects are constituted through technological mediation. This implies that the role of the moral agent need not be monopolized by a single entity. In contexts where technology is deeply embedded in practice, moral agency is best understood as a distributed and relational construct—one that resides in human-technology assemblages rather than within either pole in isolation. As Arzroomchilar and Novotný observe in their systematic exposition of Peter-Paul Verbeek's account of moral agency, its defining feature lies in ascribing moral agency to human-technology hybrids rather than to humans as such (Arzroomchilar & Novotný, 2018). This formulation captures the core position advanced in this paper: moral agency is not the exclusive property of any single entity, but is distributively constituted within human-technology assemblages.

This shift effectively introduces an ontological stance of relational ontology.

The moral subject is no longer an entity that can be fully understood in isolation from its relations; rather, it is a dynamic state that is continuously generated and stabilized within multiple human-technology relations. Postphenomenological accounts of technological mediation demonstrate that the relationship between humans and the world is always technologically mediated. Technologies reconfigure modes of perception, structures of action, and processes of meaning-making. Within this framework, subjects and technological artifacts co-constitute one another within a shared process of becoming, mutually shaping and defining each other. Accordingly, the moral subject is no longer the starting point of ethical analysis, but its outcome. Technology, in turn, is no longer merely one object among others in ethical evaluation, but a constitutive condition for the emergence of ethical subjectivity.

Postphenomenology and the later ethical work of Michel Foucault jointly advance this paradigm shift. Foucault emphasizes the constructed nature of the moral subject, arguing that subjectivity is a historically contingent form that gradually emerges within specific regimes of power and practice. He develops a situated and historically contingent notion of the subject, in which the moral subject is not an autonomous origin, but rather the outcome of processes of active subjection. Although Foucault is not a philosopher of technology in the conventional sense, his understanding of "technology" extends far beyond concrete machines or technical artifacts. He conceptualizes technologies as structured practices that govern and shape human conduct, such as "technologies of discipline" and "technologies of government". His primary focus lies on practices of self-governance and self-formation, through which individuals come to exercise control over their actions and ways of life. At the core of his ethical thought is the constitution of the subject: subjectivity is understood as the process of "becoming a subject".

Foucault maintains that in the technological age, it is inevitable that moral behavior and decision-making are mediated by technologies; however, this does not entail a loss of autonomy or freedom. On the contrary, human subjects are capable of relating themselves to the technologies that mediate them, subjecting these technologies to evaluation, experimentation, and transformation. In this sense, human beings not only retain their subjectivity, but can also actively shape the very technologies that shape them. Such technologically mediated constitution of the subject becomes a specific mode of subject formation and serves as the starting point for ethical self-practice. Inspired by Foucault, Peter-Paul Verbeek argues that subjects exist within networks of power relations embedded in the lifeworld, and that technological mediation constitutes a distinctive manifestation of power in the technological age. Rather than posing an obstacle or threat to the formation of moral subjectivity, technological mediation should be integrated into the analysis of moral agency itself.

On the basis of this shift, the central question of the ethics of technology must be reformulated. The issue is no longer "how a pre-given human subject ought to use technology morally", but rather "how technology plays a mediating and con-

stitutive role in the process through which humans are formed as moral subjects". In other words, technology is not merely a participant in moral action; it is also a condition and medium through which moral agents themselves come into being.

5.2. The Logic of Co-Constitution across Four Dimensions

In order to systematically elucidate how moral subjectivity is formed, Michel Foucault proposes four well-known analytical dimensions: ethical substance, mode of subjection, ethical work (or self-practices), and telos (Foucault, 1985). Through the analysis of these four dimensions, the interwoven character of human-technology relations emerges as the point of departure for ethical reflection.

The ethical substance refers to the aspect of the self that individuals are called upon to constitute as the primary focus of moral conduct. In ancient Greek ethics, pleasure functioned as the central ethical substance; in the technological age, however, the ethical substance is increasingly constituted through the interaction between humans and technologies. Moral concern no longer revolves primarily around passions or desires, but instead focuses on the experiential structures, distributions of responsibility, and possibilities for action that emerge from the entanglement of humans and technological systems. Accordingly, the object of moral reflection shifts from the question "How should I act?" to a more fundamental inquiry: "What kind of subject am I becoming within processes of technological mediation?" Within traditional reproductive ethics, the ethical object is often articulated in relatively abstract terms, such as parental responsibility or familial love. Ultrasound technology, however, profoundly materializes and concretizes the ethical object. It renders the health status of the fetus—through visualized and datafied forms such as nuchal translucency thickness, organ-structure imaging, and biometric indicators—as the central focus of moral concern. The moral efforts of prospective parents are no longer oriented solely around abstract notions of responsibility, but instead become focused on these concrete parameters as defined and presented by technological mediation. In this way, technology reconfigures the boundaries of what counts as an entity worthy of moral consideration.

The mode of subjection refers to how individuals establish their relation to moral rules. In ancient Greek ethics, this relation was grounded in the cultivation of noble character or in an internalized identification with moral norms. In the technological age, however, technologies guide, persuade, constrain, and regulate action in both explicit and implicit ways: interface design, preconfigured pathways, and functional hierarchies pre-structure what counts as feasible, reasonable, and even "ought" to be chosen. As a result, the meaning of moral obligation and responsibility is redefined. The subject's "obedience" to moral norms is no longer solely a matter of internal commitment, but is deeply embedded within routine interactions with technological systems. In the context of ultrasound technology, prospective parents' compliance with the norm that "prenatal examinations ought to be undertaken and their results assumed responsibility for" does not arise solely from internal moral injunctions or familial traditions. Rather, such compliance is

enacted and reinforced through a complex nexus of technological, medical, and institutional arrangements. In simplified terms, prospective parents adhere to the procedures and temporal schedules of medical examinations (undergoing specific tests at designated gestational stages); they recognize and trust the authority of ultrasound images and data, treating them as objective representations of the truth about the fetus; they internalize the boundaries between "normal" and "abnormal" as defined by risk-assessment models; and they bear pressures stemming from social norms (e.g., the view that foregoing prenatal testing is irresponsible) as well as policy recommendations. Moral compliance, in this context, is thus manifested as an alignment with and incorporation into the bodies of expert knowledge, institutional arrangements, and social expectations embodied in the technological system.

Ethical work—or self-practice—is the most central dimension in Michel Foucault's ethics. It refers to the processes through which subjects transform themselves into bearers of moral conduct through reflection, training, and experimentation. Foucault describes this as "technologies of the self", which do not entail a complete renunciation of formative influences, but rather the cultivation of an appropriate distance from them. In the technological age, ethical work primarily takes the form of an active engagement with technological mediation. Subjects do not merely learn how to use technologies; they also reflect upon how technologies shape their experiences and decisions. Ascetic practice, in this context, does not consist in restraining or rejecting technological use, but in adopting a careful and critical attitude toward technological mediation—evaluating, intervening in, and experimenting with its effects. Through such practices, high-quality forms of subjectivity are cultivated via high-quality engagements with technology. Peter-Paul Verbeek further supplements this account by noting that ethical work manifests in two interrelated ways. On the one hand, it involves the subject's skillful use of technology, including the anticipation and modification of its mediating effects. On the other hand, technological design itself can be understood as a form of ethical self-practice, insofar as processes of design already entail a form of care for the self at the level of shaping mediating structures. In order to become "responsible parents", prospective parents engage in a series of active self-practices, all of which are closely organized around—and mediated by—ultrasound technology. For instance, learning to interpret the medical terminology and data presented in ultrasound reports can be understood as a form of cognitive practice; actively seeking medical information, consulting expert opinions, and participating in relevant social group discussions on the basis of examination results constitute forms of informational practice; and undertaking complex ethical deliberations and intra-family negotiations in response to abnormal findings exemplifies decision-making practice. These "practices of the self" are far from being purely internal forms of moral cultivation. Rather, they unfold through the information, affordances, and constraints provided by technological mediation, and thus exemplify processes of self-formation under conditions of technological mediation.

The telos dimension concerns the ideal mode of being that moral activity aims to realize. In the technological age, this translates into a concern with what kind of mediated subject one becomes under conditions of technological mediation. Peter-Paul Verbeek argues that the goal of ethical self-constitution is not to rescue humanity from technology, but to enable a desirable coordination between the two. Accordingly, the criteria for moral evaluation are neither reducible to utilitarian calculations nor to the mere fulfillment of normative rules. Rather, they must be grounded in the overall quality of a subject's mode of existence within contexts of technological mediation. The key questions thus become: What kind of subject does one become in coexistence with technology? What forms of perception, attitudes of responsibility, and styles of practice are cultivated through such coexistence? In this sense, moral agency is not a victim of technological mediation, but is instead generated, distributed, and realized within the joint interaction between humans and technologies. The ultrasound case demonstrates that the overarching aim of this constellation of practices is to cultivate a new type of moral subject. Traditional parental ideals—such as "the more children, the greater the blessing" or "letting nature take its course"—are thereby reconfigured. The ideal constructed with the mediation of ultrasound technology is that of the "modern parent": rational, informed, and capable of making decisions on the basis of scientific evidence. No longer passive recipients of fate, such parents become active managers who employ technological means to regulate reproductive risks and optimize the health of their offspring. In this sense, technology helps define the teleological ideal of "what counts as a good parent". Through this interpretation of Michel Foucault's theory of subjectivation, Peter-Paul Verbeek shows that moral agency can no longer be understood as an isolated, intrinsic human capacity. Rather, it emerges as a distributed process, gradually constituted through the delineation of ethical objects, the technologization of modes of compliance, the reflective enactment of practices of the self, and the existential design of teleological imaginaries. Technological artifacts, therefore, not only shape the relations between humans and the world, but also co-constitute the very conditions of moral subjectivity.

5.3. Objection and Defense: Accountability Deficits and the Retention of Human Responsibility

Having developed the foregoing argument, it is necessary to address a direct line of objection. Critics may reasonably contend that, even if technological artifacts participate in shaping moral situations and the constitution of subjects, they nonetheless lack accountability and the capacity for reflexive self-assessment. Liu from a different angle, advances a related critique of the theory of technological mediation: when mediation intervenes too deeply in moral decision-making, human agents may face the risk of "moral suspension", whereby responsibility for moral judgment is tacitly outsourced to technological systems (Liu, 2023). This concern complements the objection from accountability, together pointing to a central dif-

ficulty in the present thesis. A speed bump or an ultrasound screen cannot provide reasons for its "actions", nor can it bear responsibility. Accordingly, critics argue that applying the term "agent" to technological artifacts conflates causal influence with moral agency.

In response, this paper contends that such objections presuppose a substantivist model of agency attribution, according to which a moral agent must be a fully identifiable, discrete entity capable of bearing responsibility independently. By contrast, within the framework of distributed moral agency advanced here, accountability is not dissolved but reconfigured: it is distributed across the human–technology assemblage rather than located in any single component. Within this assemblage, humans retain an irreducible second-order reflective role—namely, the capacity to evaluate, question, and recalibrate technological mediation itself. A pregnant woman, for instance, must still reflect on the appropriate weight that ultrasound reports should carry in her decision-making; it is precisely this capacity for reflection that marks the domain of responsibility that technology cannot replace. The more deeply technology participates in the constitution of agency, the greater the human responsibility for its design, deployment, and use. Recognizing the participatory status of technological artifacts does not diminish human agency; rather, it requires a more fine-grained understanding of the structure of responsibility within human-technology relations.

6. Conclusion

Returning to the central question posed in the title—can technological artifacts become moral agents?—this paper, through a relational reconstruction of intentionality and freedom, in conjunction with Michel Foucault's theory of subjectivation, offers the following answer: in contexts of strong mediation, technological artifacts are not fully fledged moral agents, but rather constitutive participants in distributed moral agency. The status of the moral agent should not be understood as a property monopolized by an isolated entity, but as a relational function that emerges within human-technology assemblages.

Intentionality has been reinterpreted as a relational directedness distributed across human-technology relations, whereby technological artifacts, through their structured forms of directedness, participate in shaping modes of perception and possibilities for action in concrete contexts. Freedom has been reconceived as a relational practice unfolding within technologically mediated situations: rather than consisting in independence from technological influence, freedom lies in the capacity to actively establish reflective relations with mediating forces. On this basis, the moral subject itself is no longer treated as a pre-given starting point of practice, but as the outcome of co-constitution across four dimensions—ethical substance, mode of subjection, ethical work, and telos—within which technology plays an integral role.

This argument advances a paradigm shift in the ethics of technology. The central question is no longer "how a human subject ought to use technology morally",

but rather "how technology plays mediating and constitutive roles in the formation of subjectivity". To acknowledge the moral agency of technological artifacts does not entail dissolving human responsibility; instead, it calls for a reconfiguration of responsibility as distributed within human-technology assemblages. It further demands that, in both the design and use of technology, we continually reflect on a fundamental ethical question: what kind of subjects we seek to become, and how technologies enable or constrain that becoming.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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