Openness of Designs and Ethical Values: Outlining a New Ethical Framework for Our Technological Future

Giannis Perperidis

Περίληψη_ **Γιάννης Περπερίδης | Ανοιχτότητα των σχεδιασμών και ηθικές αξίες: Σκιαγραφώντας ένα νέο ηθικό πλαίσιο για το τεχνολογικό μέλλον μας**

Το παρόν κείμενο παρουσιάζει ένα νέο ηθικό πλαίσιο για τις σημερινές και μελλοντικές τεχνολογικές κοινωνίες. Παρά τον πολλαπλασιασμό των μελετών στο πλαίσιο των Σπουδών Επιστήμης και Τεχνολογίας, καθώς και των κριτικών φιλοσοφικών προσεγγίσεων της τεχνολογίας, η επιρροή του τεχνολογικού ντετερμινισμού παραμένει ισχυρή σήμερα εκτοπίζοντας από το πεδίο της τεχνολογίας τις ηθικές κρίσεις. Στο παρόν κείμενο, υποστηρίζω την ενσωμάτωση μιας φιλοσοφίας της τεχνολογίας που αμφισβητεί τον τεχνολογικό ντετερμινισμό ως προϋπόθεση για τη διατύπωση μιας συνεκτικής ηθικής σήμερα. Υποστηρίζω ότι οι πολλά υποσχόμενες ηθικές θεωρήσεις διανοητών όπως ο Hans Jonas και η Corine Pelluchon, αν και εξαιρετικής σημασίας, δεν δίνουν την απαιτούμενη έμφαση στην ηθικοποίηση των τεχνολογικών σχεδιασμών ή στην πολιτικοποίηση της τεχνολογίας. Το επιχείρημά μου αποκτά και πρακτικό έρεισμα, λόγω της ανάδυσης σήμερα των «ανοικτών τεχνολογιών» που λειτουργούν στο πλαίσιο των παραδειγμάτων των «κοινών» και της προσέγγισης «ηθικής εκ σχεδιασμού». Αυτές οι εξελίξεις, υποστηρίζω, υπόσχονται την προώθηση των οραμάτων που περιγράφουν φιλόσοφοι όπως ο Peter-Paul Verbeek και ο Andrew Feenberg. Κεντρικός στόχος του κειμένου είναι η πρόταση διεύρυνσης και ενίσχυσης των σύγχρονων ηθικών θεωριών, όπως εκείνες του Jonas και της Pelluchon μέσα από το πρίσμα μιας φιλοσοφίας της τεχνολογίας, η οποία ενσωματώνει την ηθική παρέμβαση σε ανοικτούς τεχνολογικούς σχεδιασμούς που παραδοσιακά θεωρούνταν ντετερμινιστικοί και κλειστοί.

Introduction

In the contemporary era characterized by rapid technological advancement, the pace of technological progress often outstrips our capacity for speculation regarding the trajectory of advancements within each technological domain. This accelerated development, coupled with prevalent deterministic viewpoints concerning technologies, fosters extrinsic moral assessments concerning technical artifacts. Such assessments frequently advocate for the cessation or deceleration of technological development.[1] Within this paradigm, ethics

[1] Such an opinion was expressed from strong corporate agents like Elon Musk and Steve

is conceived as distinct from technology and is applied externally to the latter. Technology evolves on its own terms, primarily driven by the imperative of efficiency: each technical artifact is expected to surpass its predecessor in terms of efficiency. Consequently, a smartphone is perceived as a superior iteration of the conventional phone prevalent in the early 2000s, offering enhanced performance and efficiency. Resisting the transition from the former to the latter would entail a regression to a previous, ostensibly less technologically advanced era characterized by inefficiency and sluggishness. The cessation of the development of a technical artifact is only countenanced if it is deemed to herald an unethical or deleterious future. This phenomenon, commonly referred to as technological determinism, persists despite the emergence of various alternative approaches to the study of technology and its development. This resilience can be attributed to its enduring influence on public perceptions of technology, as noted by scholars such as Wyatt[2] and Staudenmaier.[3]

This paper endeavors to delineate a distinctive moral theory, one that arises from a philosophy of technology informed by the insights of Andrew Feenberg and the interdisciplinary field of Science and Technology Studies. Even within the realm of ethical inquiry at its zenith, ethical frameworks primarily offer guidelines for discerning the desired trajectory of technological development or for evaluating instances where technology engenders unethical or calamitous circumstances. This sentiment is encapsulated in Hans Jonas's concept of the "heuristics of fear," which underscores the imperative of contemplating the ramifications of technological innovations, thereby sanctioning certain technical advancements while proscribing others (Jonas 1979; 1984, 29–31). Conversely, some philosophers tend to accentuate the epistemological and anthropological dimensions inherent in the act of technological innovation. Corine Pelluchon's ethics of consideration serves as a pertinent exemplar of such a paradigm (Pelluchon 2018). Pelluchon's focus on the corporeality of the subject endeavors to redefine the very essence of the "subject" engaged in technological creation, albeit without a clear reference to the intricacies of technological design itself.

I posit that the aforementioned endeavors to explicate ethical frameworks overlook the fundamental essence of technological design. Drawing from Peter-Paul Verbeek's analysis of the materialization of values in design, Langdon

Wozniak when, in March 2023, they –along with many others– signed an open letter for the temporary shutdown of the research regarding AI, due to the development of the ChatGPT and its potentially unethical consequences.

[2] In her work "Technological Determinism is Dead; Long Live Technological Determinism" (2008), Sally Wyatt critiques and revises technological determinism, emphasizing the complex interplay between technology and society.

[3] In "Rationality, Agency, Contingency: Recent Trends in the History of Technology" (2002), John Staudenmaier explores how historians now emphasize human agency, contextual rationality, and contingency in technological development.

Winner's discourse on the politics inherent in artifacts, and Andrew Feenberg's critique of technology, I contend that ethical approaches such as the "heuristics of fear", meaning the pre-figuring of what dangers might occur from future technologies; or the ethics of corporeality, which evaluates technologies based on their effects on the human body and epistemology remain limited if solely applied to technology post-construction. This is because they fail to address the intrinsic essence of their design. Therefore, a theoretical framework capable of nurturing the development of applied ethics pertinent to contemporary and future technologies must traverse the terrain of philosophy of technology, particularly delving into in-design accounts, while steadfastly challenging technological determinism.

Hence, the initial section of this paper scrutinizes technological determinism and its interplay with ethics. Can moral judgments be envisaged within a technologically deterministic milieu, where technologies evolve in accordance with predetermined trajectories? Subsequently, the ensuing section endeavors to delineate an alternate context from which an ethics applicable to the contemporary and future world might emerge. This section is informed by Feenberg's critical theory of technology and the tenets of social constructivism from Science and Technology Studies (STS). While Feenberg developed his theory with the intent of fostering political alternatives, I contend that analogous principles can facilitate the establishment of an ethical discourse that integrates insights into the inherent nature of technical artifacts alongside considerations of their design.

The final part of this paper delves into the role of experts within the contexts of determinism and critical constructivism. The conceptualization of the "expert" or the "designer" holds profound significance in technological spheres, and contemplation of their roles within societies is imperative for the emergence of ethics in a technologized world. I conclude this paper with reflective remarks concerning the ramifications of such an ethical framework across various domains. How can we broach discussions on medical technologies ethics, engineering ethics, or environmental ethics without due consideration of technical designs and their production processes?

1. Searching for moral values in technological determinism

In this chapter, I undertake an examination of the moral implications inherent in accounts of technological determinism. While the literature concerning technological determinism is expansive, my focus here is not to merely reiterate established insights into this approach to technology, but rather to probe into some of the ethical ramifications arising from its development.

Heilbroner (1994a, 70), akin to numerous proponents of technological determinism, underscores the pivotal role of technology in shaping the fabric of society. According to this perspective, a society's structure, encompassing its

religious practices, economic transactions, and social dynamics, is intricately intertwined with the affordances afforded by its technological milieu. The features inherent in available technologies delineate the contours of permissible social relations, with ideologies and religious doctrines often conforming to the trajectory of technological innovation. Implicit within this approach is the notion that domains such as ethics, politics, or aesthetics are extraneous to technology and warrant examination as external factors. Technology, operating within the domains of rationality and efficiency, follows an autonomous trajectory of development, engendering societal forms that, in turn, shape social structures devoid of reciprocal feedback.

Another great scholar for the evaluation of technological determinism is Bruce Bimber. His approach to technological determinism offers a nuanced analysis by distinguishing it into three dimensions: normative technological determinism, nomological technological determinism, and the concept of unintended consequences (Bimber 1994). It is important to delve more into these categories to clarify what determinism is exactly. a) Normative technological determinism suggests that technology should guide the structure and values of society, advocating that technological progress drives social progress and that societal norms should align with technological advancements. This perspective views technology as a force that should shape social behaviors and standards (Bimber 1994, 81–83). In contrast, b) nomological technological determinism posits that technology inevitably influences society due to the laws of nature. This dimension argues that technological development follows a predictable, law-like trajectory that shapes societal structures and cultural practices, suggesting that technological changes lead to certain inevitable social outcomes driven by the inherent properties of technology itself (Bimber 1994, 83–85). c) The third dimension, unintended consequences, addresses the idea that technological developments often lead to unexpected social changes. This view acknowledges that while technologies are created with specific goals, their implementation can result in unforeseen social, cultural, and economic impacts, highlighting the complexity and unpredictability of the relationship between technology and society (Bimber 1994, 85–86). Bimber's framework clarifies the different ways technology can influence society, emphasizing the importance of considering both the intended and unintended consequences of technological change and the normative assumptions that often underpin discussions about technology's role in shaping social dynamics. The third category Bimber introduces could be useful for the argument articulated in this essay if placed in a more political-ethical context that surpasses determinism.

Continuing with the approach to determinism, a substantial historiographical tradition espouses a deterministic interpretation of technology's role in shaping historical trajectories. Within this framework, technology is portrayed as a driving force propelling societies toward distinct epochs. Exemplifying this

historiographical trend is the scholarship of Lefebvre des Noettes (des Noettes 1931; Löwenthal 1933), who presents technological developments in a deterministic light, thereby segregating technology from considerations of ethics or politics. For instance, des Noettes, as Löwenthal highlights, contends that the decline of the institution of slavery in late antiquity was precipitated by the advent of technological innovations augmenting the labor capacity of animals, thereby obviating the need for human slaves (Löwenthal 1933, 202), with moral considerations playing a negligible role in this societal transformation.

The aforementioned examples underscore the perceived agency of technology in charting the course of historical evolution. This sentiment is epitomized in Heilbroner's seminal inquiry, encapsulated in the title "Do Machines Make History?" (1994b). Moreover, as posited by Edgerton (1999, 120), if society is indeed shaped by the prevailing technological milieu, then moral theories are contingent upon the stage of technical progress, rendering individuals incapable of assuming responsibility for actions stemming from technical processes.

However, the deterministic nexus between technology and ethics engenders certain challenges, particularly concerning the attribution of responsibility for actions and subsequent moral judgments pertaining to technology. Charles Perrow's seminal work, "Normal Accidents" (1984), offers poignant insights into this conundrum by asserting that increasingly complex technical systems inherently harbor greater instability, thereby heightening the likelihood of accidents. Given the contemporary reliance on intricately interwoven technological infrastructures, society finds itself ensconced in a precarious milieu where technological mishaps may occur with alarming frequency, some resulting in significant casualties. Consequently, we inhabit a perilous and uncertain environment, characterized by elevated risk levels, a notion cogently expounded by Ulrick Beck in his articulation of the "risk society" paradigm (1992).

According to the deterministic worldview, the emergence of complex technological systems unfolds according to preordained trajectories, uninfluenced by moral considerations, political agendas, or anticipations regarding future societal paradigms. In light of this deterministic paradigm, how then can we morally adjudicate catastrophic events such as nuclear plant accidents, which result in vast casualties, potentially extending to millions over time? If the genesis of such intricate technological systems and the concomitant uncertainties and risks they engender were predestined, who bears culpability for such disasters? Technical actions, akin to conventional actions, entail responsibility towards both contemporaneous individuals and future generations. However, within the deterministic framework, technical actions are deemed immune to moral judgment, as the progression of technology and the accidents it precipitates, owing to the complexity of technical systems, remain insulated from the moral fabric of society. Indeed, technological determinism enjoins us to acquiesce to the reality of inhabiting an uncertain and perilous world, impervious to soci-

etal amelioration, as technological progress autonomously unfolds, promising eventual amelioration and unprecedented enhancements in human welfare.

To delve into the ethical implications underpinning technological determinism, it behooves us to explore another philosophical discourse elucidating the formidable and autonomous dominion of technology, prognosticating a dystopian future. In evoking the notion of technology's absolute ascendancy, one inevitably encounters the seminal insights of Martin Heidegger and his conceptualization of the Ge-stell (Heidegger 1977a). In his seminal work "The Question Concerning Technology," Heidegger expounds upon his essentialist conception of technology, positing that within the milieu of modernity, technology assumes a pervasive hegemony, reducing diverse forms of existence to mere raw materials for instrumental exploitation. Within this schema, everything is subsumed under the rubric of functionality, divested of intrinsic ethical, political, or aesthetic values. Heidegger contends that the ontological essence of modern technological forms is revealed solely through technical means, precluding any alternative modes of revelation. Consequently, modernity begets technological configurations that are ontologically circumscribed by their technical essence, devoid of inherent ethical, political, or aesthetic dimensions.

The scholarly discourse surrounding Martin Heidegger's philosophy of technology remains open to interpretation, with ongoing debates concerning whether his framework exhibits an ahistorical, substantivist, or one-dimensional orientation (Thompson 2006). However, it is undeniable that Heidegger's ontological elucidation of technology imbues his outlook with a deterministically informed pessimism, encapsulated in his famous assertion, "only a God can save us now" (Heidegger 1977b), signifying the culmination of technology's pervasive enframing as analyzed by Heidegger. Regarding the ethical ramifications inherent in Heidegger's viewpoint, a pivotal reference warrants consideration. In a lecture from 1949, Heidegger contends, as quoted by Rockmore (1992, 241), that "[A]griculture is now the mechanized food industry, in essence the same as the manufacturing of corpses in gas chambers and extermination camps, the same as the blockade and starvation of nations, the same as the production of hydrogen bombs." Feenberg employs this excerpt to assert that Heidegger's approach to technology engenders symmetry in evaluating vastly divergent designs and technologies, an outcome stemming from his adherence to technological determinism (Feenberg 2010, 25). Heidegger eschews social and ethical interventions aimed at reforming technology, asserting its autonomous evolution on its intrinsic terms.

While an exhaustive examination of Heidegger's philosophy of technology exceeds the scope of this discourse, it merits acknowledgment that his insights remain profoundly relevant today, with numerous scholars developing innova-

tive approaches to technology rooted in his doctrines.[4] However, the purpose of invoking Heidegger's insights in this section of the paper was not to offer a comprehensive critique or validation of his framework. Rather, it aimed to illustrate how philosophically informed perspectives, bordering on technological determinism, tend to relegate ethics to a secondary status vis-à-vis technological design.[5] In the subsequent sections of this paper, I endeavor to elucidate strategies for transcending technological determinism, thereby fostering an environment conducive to the emergence of ethically informed approaches to technology design.

2. Upon opening the black box and finding it full of values

To counter the deterministic underpinnings of technological discourse, I adopt an approach to technology espoused by Science and Technology Studies (STS) scholars, notably exemplified by Feenberg's perspectives. A poignant encapsulation of this stance is articulated by Andrew Ede, who asserts that "[T]o really understand the world of the Babylonian surgeon, we must learn about the network and social context that made his technology possible" (Ede 2019, 5). The title of this section of the paper serves as a deliberate allusion to Winner's seminal work titled "Upon Opening the Black Box and Finding It Empty" (Winner 1993).

To substantiate the implications of the title, I commence by elucidating a prominent example drawn from the annals of Science and Technology Studies: the Long Island Expressway bridges engineered by Robert Moses, as scrutinized by Langdon Winner in his seminal treatise "Do Artifacts Have Politics?" (Winner 1980, 123–25). Moses's strategic design of these bridges, deliberately incorporating lower clearance heights, effectively barred individuals from lower socioeconomic strata, particularly Black and laboring communities, from accessing his envisioned Jones Beach Park. This strategy ensured the park's accessibility primarily to the middle-class car owners, while impeding the passage of buses transporting marginalized social groups (Caro 1975). Winner invokes this illustrative case to underscore the inherent political dimensions of technology, transcending mere utilitarian considerations. According to perspectives derived from STS and critical constructivism, technology must not be assessed solely based on its instrumental utility. However, within deterministic frameworks, if technology inexorably evolves towards enhanced effi-

[4] For more on the importance and the specific elements of Heidegger's philosophy of technology see: Spinosa et al. 1997; Maggini 2006; Rigal 2006; Mößgen 2007, and Riis 2011.

[5] It would be impossible to criticize Heidegger's essentialism in one brief paper. Such a critique was not the aim of this chapter. Heidegger's influence on the philosophy of technology is enormous. Here, I attempted to show that this kind of thought (such as Heidegger's) introduces a kind of determinism or essentialism from which it might be very difficult to sketch a kind of Ethics of technology.

ciency, then Moses's bridge design would be perceived as merely a transitional phase in the evolutionary trajectory of bridge engineering, precluding moral judgments on its purported racism or ethical implications.

In this chapter, I endeavor to substantiate the argument that ethical deliberations concerning technology necessitate a probing examination of the "black box" of technological artifacts, thereby unveiling the underlying values that inform their design. The concept of the black box, frequently invoked in STS literature (Winner 1993, 365–70; Pinch & Bijker 2012, xviii), assumes paramount importance in this discourse, as it represents the latent ideational substrates concealed beneath the veneer of technological manifestations. Moses's bridges serve as a poignant illustration, with the black box encapsulating his ideological predispositions regarding marginalized communities. Crucially, within the black box, not only are technical specifications housed, but also the entire nexus of relations between creators, designs, and perceived efficiency. This constellation delineates the essence of a technological artifact, with considerations of efficiency and design inseparably intertwined with the values and intentions of both creators and users, constituting an integral facet of its ontological fabric.

An additional conceptual framework crucial for formulating a nuanced ethics of technology is that of scripting and delegation.[6] In the case of Moses's bridge design, he effectively scripted the entire process of individuals attempting to traverse to the other side by alternative means, thereby delegating to the technical artifact the task of thwarting such efforts. Concurrently, Moses imbued the bridge design with the social power dynamics between different societal groups, notably scripting the struggle of the middle-class white populace to exclude marginalized groups, such as blacks and lower-class laborers, from accessing their spaces. This interplay between scripting and delegation embeds specific normative and ethical content within the technical artifact, elucidating how social power dynamics are manifest in the very design of technology. Consequently, attempts to critique figures like Moses for unethical practices necessitate an interrogation of the racist values encoded within the black box of technological artifacts. Mere condemnation of the bridge as a technical artifact, devoid of an examination of the underlying values inscribed within its design, proves inadequate for mounting an effective ethical counterattack or effecting attitudinal shifts towards marginalized groups.

[6] Both concepts (that of technological scripting and that of delegation) have been developed within the Actor–Network theory introduced mostly by Bruno Latour.

In brief, Madeleine Akrich's notion of "scripting" refers to how designers inscribe particular visions, behaviors, and roles into technological artifacts, guiding how users interact with and use these technologies (Akrich 1992). Bruno Latour's notion of "delegation" refers to the process by which human tasks and responsibilities are transferred to non-human actors, such as technologies or objects, thereby shaping human actions and interactions through these delegated functions (Latour 1992).

To elucidate the potential avenues for cultivating a more sophisticated ethics of technology, we turn to the insights of Andrew Feenberg. Feenberg contends that technological determinism derives its potency from the "illusion of rational necessity," wherein contemporary societies exclusively valorize what is perceived as rational, namely technology, bureaucracy, and economy, while marginalizing other considerations (Feenberg 2018, 15). Central to Feenberg's framework is the concept of "participant interests," which exert influence over technological designs (Feenberg 2002). He posits that there exists an interpretative dispute regarding the essence of technical artifacts, termed "interpretative flexibility" (Feenberg 2010, 10), whereby social groups imbue technologies with meanings, thereby influencing and partially determining their design through a process Feenberg dubs "secondary instrumentalization" (Feenberg 1999, 179).[7] Moreover, Feenberg contends that technical designs are not solely dictated by rational considerations and efficiency, but are also shaped by the values of social groups, underscoring that "values are the facts of the future" (Feenberg 2017, 8). Thus, Moses's bridge design was not solely the product of a detached engineering process; rather, it materialized the normative contents and ethical perspectives of specific societal subjectivities, with Moses serving as the conduit through which participant interests were delegated into the technical arrangement, thereby actualizing certain groups' exertion of power over others within society.

If technologies indeed constitute a "parliament of things," as posited by Latour (1993, 142), then it follows that they also serve as a forum for ethical deliberation, underscoring the imperative for philosophy to scrutinize them through this lens. Moreover, in line with the insights of theorists such as Laclau and Mouffe, who contend that the struggle for hegemony over societal meanings is inherently political,[8] it becomes evident that technology, politics, and ethics are inexorably intertwined and necessitate a holistic examination. A cogent ethics cannot be achieved without addressing the dynamics of meaning dominance within society and the consequential delegation of dominant meanings to technical artifacts, which effectively script the experiences of users. While Corine Pelluchon rightly advocates for a renewed ethical discourse coupled with a focus on politics (Pelluchon 2016, 300–2), she overlooks the pivotal role of technology and its designs in shaping ethical landscapes. Conversely, Feenberg emphasizes the politics of technology without due consideration for ethics, a lacuna that I argue is indispensable for the emergence of an alternative modernity.

[7] Secondary instrumentalization follows the "primary instrumentalization" which refers to the initial stage of technology development where tools and devices are created to control and manipulate the natural world, focusing on efficiency and utility (Feenberg 1999, 178).

[8] For more information on Laclau and Mouffe's notion of the "Political" see their work *Hegemony and Socialist Strategy* (1985).

Central to an ethical evaluation of technologies is an interrogation of the values inscribed within their mechanisms. This necessitates a critical examination of the values enshrined within the black box of technology. Only through such scrutiny can a robust ethical framework be constructed. How else can we address issues of animal abuse and advocate for animal rights when many industrial facilities in the West confine animals to maximize productivity throughout their lifespan? The imperative of delegating the value of animal rights to machines, thereby altering their design, underscores the urgency of opening up the design process to incorporate values from diverse social groups, rather than solely catering to the profit-driven agendas of corporations. This act of democratizing the design process is inherently political, as espoused by Feenberg's politics of technology, and is informed by ethical considerations rooted in social meanings. The heuristics of fear or the ethics of consideration must be integrated into the design process itself, rather than being retroactively imposed on completed designs, thus ensuring that moral values are materialized within designs from their inception.

The quest for an ethics tailored to the technologized milieu represents a collective endeavor aimed at actualizing a moral fabric manifest within mechanisms and designs, rather than constituting mere extrinsic moral censures aimed at halting the production or development of entire technologies. The latter approach aligns with a paradigm of technological determinism, which delineates a stark dichotomy between material artifacts and human agency, thus bifurcating technology from prevailing social norms. My analysis closely parallels the insights of Peter-Paul Verbeek, particularly his exploration of morality through technical mediation (Verbeek 2011, 6), as well as complementary frameworks for embedding morality within design, as elucidated by eminent Dutch philosophers of technology.[9] This means that not only a politics of technology (Feenberg) is important, but an ethical evaluation of the technological design is necessary too. By combining Feenberg and thinkers such as Verbeek, Kroes and van de Poel, one can achieve an opening of the black box of technology and an ethical assessment of the values that dictate the very design of the technical artifact. Ethics, as politics too, is materialized into artifacts; thus the designing process and stage of such a materialization is the most important element in technological development.

3. Experts, the closeness and openness of designs

A pivotal concept within the aforementioned paradigms is that of the "expert". The societal interpretation of experts, encompassing designers and inventors,

[9] At this point I refer to philosophers such as Peter Kroes, Sven Ove Hansson and Ibo van de Poel who are of great importance for the intersection of philosophy of technology and engineering today. See van de Poel & Kroes 2014; Kroes & van de Poel 2015; Hansson 2017; and van de Poel 2013; van de Poel & Royakkers 2023.

alongside delineating their roles and boundaries, profoundly shapes both the design outcomes and the societal interactions with technology. It is imperative to scrutinize the nature of expertise engendered by the paradigms delineated in preceding chapters and elucidate the precise role of experts within these frameworks.

Within the deterministic context, experts assume paramount significance in the trajectory of technological development. Under the premise of technological autonomy, wherein technology evolves solely on its own terms, experts emerge as the sole agents capable of driving innovation and fortifying the technical infrastructure of society. Consequently, expertise becomes a distinct realm reserved for a select cadre of individuals who possess specialized training and extensive experience, relegating non-specialized members of society to a peripheral role devoid of jurisdiction over the domain of experts. Users, in turn, are relegated to passive recipients of technologies ordained by experts, assured of their efficiency by virtue of their genesis in the hands of those who epitomize the essence of technological prowess.

Furthermore, within the context of technological determinism, experts acquire an aura of mystique and reverence akin to a sacrosanct priesthood. They are perceived as possessing an almost preternatural ability to resolve any technical conundrum, ranging from mundane tasks such as repairing furniture to undertaking complex genetic programming. Such fervent faith in the enigmatic capabilities of experts finds resonance in Neil Postman's delineation of modernity's allegiance to scientific authority. In his seminal work *Technopoly: The Surrender of Culture to Technology* (1993, 73), Postman asserts that contemporary society's unwavering deference to scientific authority parallels medieval society's adherence to religious doctrine. Implicit in this observation is the notion that, within the deterministic paradigm that heavily influences public perceptions of technology, experts assume a quasi-divine status; they serve as intermediaries between users and technology. Given the prevailing conception of technology as merely applied science, experts are deemed the sole arbiters qualified to engage in discourse concerning technology.

In contrast, within the alternate context where lay users actively shape design processes and infuse their values, the role of experts transcends mere mediation between users and technology. Rather, experts are integral participants in design endeavors alongside non-specialized users, whose lived experiences with technologies furnish valuable insights for integrating alternative values into future designs. Feenberg contends that in the contemporary technologized milieu, or what he terms the "technosystem,"[10] the indispensability of experts remains undeniable; their expertise is essential for crafting novel designs or rectifying existing ones efficiently. However, Feenberg advocates for

[10] In order to clarify what the "technosystem" is, I insert here Feinberg's own words:

an expanded dialogue between experts and users to engender a more inclusive design ethos, thereby facilitating the incorporation of diverse participant interests into technological frameworks. This necessitates fostering stronger co-existence and interaction while bridging the gap between these two constituencies.

While Feenberg's proposal holds considerable significance, it is essential to scrutinize the notion of the "expert" within the context of operational autonomy (Feenberg 2010, 69), as it arguably perpetuates the very gap Feenberg seeks to surmount. In the contemporary deterministic milieu, experts serve as intermediaries between users and technology, yet they remain distinct entities vis-à-vis the technological artifact itself. Although experts contribute to the creation of technical artifacts, technology's autonomous trajectory, divorced from external influences, dictates the predetermined form of the artifact. Thus, while enhancing communication between users and experts is imperative, it alone cannot redress determinism or the capitalist framework underpinning expertise and production processes.

Indeed, corporations and managerial echelons, wielding control over design processes (exemplifying operational autonomy per Feenberg's framework), perpetuate this very gap to safeguard innovation as an insular endeavor confined to laboratory settings, orchestrated by detached experts. Engineers and software developers are cast as solitary innovators, enhancing technical features in isolation from social, ethical, and political considerations. Technologies are developed within closed systems, their black boxes shielded from external scrutiny, symbolizing a deterministic paradigm wherein improvements or alterations are confined within the confines of technical rationality, perpetuated by the initial creators—the experts—tasked with materializing corporate interests. This insularity of technical design reinforces determinism, constraining technological evolution within the confines of its own predetermined trajectory.

This is not merely an abstract observation but a reflection of how capitalism and operational autonomy conceptualize experts. Within this framework, achieving a more fluid interface between experts and lay users—one that transcends individual design alterations like the Minitel case (Feenberg 1995, 100–5)—requires systemic transformation with potentially transformative implications. While there remains a genuine need for individuals capable of creating and repairing artifacts while translating users' values and experiences into technical specifications, effecting democratic interventions neces-

> "In my own work, I have focused primarily on technologies and technical systems, but markets and administrations continually show up in the analysis. This version of my approach is generalized to cover all three institutions. For the sake of brevity, I will employ the term "technosystem" to refer to the field of technically rational disciplines and operations associated with markets, administrations, and technologies" (Feenberg 2017, x).

sitates reshaping the context in which such individuals operate. Only through such structural changes can moral values and ethical choices be infused into technology, thereby aligning with Verbeek's vision of a moralized technology. The materialization of morality in technology inherently involves experts. However, the pivotal question remains: Do we require enhanced interaction between users and experts within the existing paradigm, or do we necessitate a new context wherein the very conception of the "expert," along with their subjectivity and operations, undergoes transformation?

Is such a context feasible today, or is it a utopian ideal beyond our grasp? I posit that glimpses of such a paradigm are discernible within two emerging paradigms: one political and the other systematic-practical, focusing on the design process. Firstly, the paradigm of the "Commons" embodies a community-centric approach wherein creators and users converge.[11] Within digital commons and fablabs, users—referred to as commoners—directly influence technology design, bypassing traditional mediators.[12] Recent research underscores the necessity for a counter-hegemonic concept of innovation, disentangled from capitalist influences and, I argue, determinism (Robra et al. 2023). Fablabs serve as collaborative spaces where individuals engage in discussions about designs, operations, technicalities, and societal implications, fostering a participatory process wherein societal norms, politics, aesthetics, and ethics inform technological design decisions.

In this conceptualization, experts function as integral components within a broader social fabric, lacking clear demarcation from other users. Within fablabs, all participants—including those with specialized expertise—play pivotal roles in directing technology design, collectively translating societal, ethical, political, and aesthetic values into actionable technical specifications. It's imperative to delineate this context from participatory design paradigms, where experts may solicit input from lay users but ultimately retain primacy in decision-making. This distinction is underscored by the acknowledgment of renowned architect GianCarlo de Carlo, who, despite engaging in participatory design endeavors, ultimately adhered to his initially conceived ideas in designing houses (Charitonidou 2023, 235–45).

The second paradigm conceptualizes openness through the opening up of the designing process of artifacts and building-in certain values. Various philosophical attempts focus on the ethical dimensions of the designing of artifacts. The most important are: Value-Sensitive Design which emphasizes the importance of integrating human values into the design of technologies. It rec-

[11] Such an opinion is being expressed by important commons theorists such as David Bollier, Silke Helfrich, Michael Bauwens. See Bollier 2014, 10; Bollier & Helfrich 2019, 15–20; Bauwens et al. 2019.

[12] The role of technology for the commons is expressed in works such as that of Vasilis Kostakis and his colleagues (Kostakis et al. 2015 and Kostakis et al. 2018).

ognizes that technologies have the potential to influence human behavior, relationships, and well-being, and therefore, their design should take into account ethical and moral considerations. Accounts on this direction have been developed by Rob Kling,[13] Batya Friedman and Peter H. Kahn Jr.,[14] Wendell Wallach and Colin Allen,[15] and Batya Friedman and David Hendry;[16] and Ethics in design, which is also of much importance, it is closely related to value-sensitive design but with a broader focus on ethical considerations throughout the entire design process, rather than solely on the integration of human values. In this field, crucial accounts have been developed by Nynke Tromp, Paul Hekkert and Peter-Paul Verbeek,[17] and Tim Brown.[18] A philosophical mapping, explanation and application of such trends in philosophy of technology, engineering and Design Ethics can be found in the works of Jeroen van den Hoven, and Ibo van de Poel.[19] More recent trends in this respect focus on the by-design impo-

[13] I refer to the edited volume by Kling entitled *Computerization and Controversy: Value Conflicts and Social Choices* (1996), the texts of which explore the social implications of computerization. They address conflicts, ethical issues, and societal choices related to the widespread adoption and integration of computer technologies.

[14] Their book *Value Sensitive Design: Theory and Methods* (Friedman, Kahn, & Borning 2003) outlines an approach to designing technology that takes human values into account throughout the design process. It provides theoretical foundations and practical methods for integrating ethical considerations into technological development.

[15] This book entitled *Moral Machines: Teaching Robots Right from Wrong* (2009) discusses the ethical and philosophical challenges of creating autonomous machines capable of making moral decisions. It explores the complexities of programming robots and AI systems to act ethically in various scenarios.

[16] A very important book entitled *Value Sensitive Design: Shaping Technology with Moral Imagination* (2019). It provides comprehensive insights into integrating human values into technology design, emphasizing the role of moral imagination in anticipating and addressing ethical issues throughout the design process.

[17] Maybe one of the most important accounts in the in-design context. The text "Design for Socially Responsible Behavior: A Classification of Influence Based on Intended User Experience" (2011) explores how design can influence user behavior towards socially responsible actions, categorizing different design strategies based on their intended user experiences.

[18] Brown's book entitled *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation* (2009) is of much importance. It explores the principles and methodologies of design thinking and how they can be applied to drive organizational change and foster innovation. Moreover, it emphasizes a human-centered approach to problem-solving and innovation in various sectors.

[19] Both Jeroen van den Hoven and Ibo van de Poel have developed an important account for the philosophy and engineering focusing on the ethics of design. I refer to the books *Designing in Ethics* (van den Hoven, Miller, & Pogge 2017) where an account on integrating ethical considerations into the design process of technological systems and artifacts is developed; and *Handbook of Ethics, Values, and Technological Design: Sources, Theory, Values and Application Domains* (van den Hoven, Vermaas, & van de Poel 2015) where a comprehensive overview of ethical theories and principles relevant to technological design, emphasizing practical applications across various domains are provided. By van de Poel the book *Ethics, Technology, and Engineering* (van de Poel & Royakkers 2023 [[1]2011]); and by van den Hoven, also, the

sition of values in digital technologies and Artificial Intelligence (A.I.).[20] Ethics by Design for A.I. constitutes a nascent ethical framework within the domain of technology, predominantly tailored for application within the context of A.I.

In essence, approaches, such as the above mentioned, diverge from the conventional post-production ethical assessment of technical artifacts, specifically at the deployment and utilization phases of the production. Instead, they proactively instate ethical values during the design phase by formulating a policy framework grounded in specified values and elucidating methodologies for their translation into technical specifications. Significantly, this investigation addresses both the theoretical foundations and practical instantiation of Ethics by Design, thereby contributing to a nuanced comprehension of its emerging role within the ethical discourse surrounding analogue technologies, digital application and A.I. A notable aspect of this theoretical framework lies in its acknowledgement that an artifact's design, while influential, remains subject to potential technical alterations through diverse user interactions and audience engagement (Brey & Dainow 2023, 3). This acknowledgment introduces a crucial element of uncertainty and underscores the capacity for users to re-appropriate a technical artifact, thereby averting deterministic outlooks and enhancing the framework's resilience in accommodating the intricacies of user agency and technological adaptability.

To conclude this chapter, I will provide an outline of my thesis in regards to the theories mentioned and developed in this paper. Feenberg's theory provides the basis for a politics of technological design. From Feenberg we acquire the insights that we need to open every technology's black box in order to check which values constitute its design. We add, here, through Verbeek and other philosophers from the in-design point of view, the need to focus more on the ethical values that dictate a technical design, an aspect Feenberg's theory lacks. It is important to always remember that values, either political, ethical, aesthetic or other, are implemented within mechanisms, thus being materialized through them. Therefore, the literature regarding in-design ethics provides theoretical tools and ways to implement one or another value in designs, while the commons projects exemplify a socio-political alternative, which can incorporate a kind of opening the black box of technologies in order to introduce new ethical (and other kind of) values.

Pelluchon's or Jonas's ethical theories are not being referred in this text as dated or old-fashioned, but as lacking this exact element: the fact that ethics

chapter "Value Sensitive Design and Responsible Innovation" (2013), in which he explores the intersection of ethics, engineering, and technology, while covering various ethical issues and dilemmas that arise in engineering practice and discusses frameworks and approaches for ethical decision-making.

[20] I refer here to the important essay by Brey and Dainow "Ethics by Design for Artificial Intelligence" (2023) in which the authors provide specific insights on how to impose ethical values already from the initial design stages of AI technologies.

needs to be materialized and practiced through the utilization of specific artifacts. Ethical theories need to be reconciled with an in-design and political philosophy of technology in order to avoid the mistake of developing ethical discourses for matters that are unethical due to the usage of specific mechanisms. In example, can we develop a whole theory for the safety and well-being of animals while in practice the agro-food industry strives for profit through the utilization of mechanisms that deprive the animals of any rights and dignity? No. My thesis would be to: change the very technological structure (and of course the socio-political and economic structures that follow – builds-up on it). This would be an ethical assessment of current agro-food mechanisms. It is important to move towards technologies that have already from the beginning been designed upon certain ethical values; not discuss about their ethical implications afterwards. The combination of the theories I sketch in this paper advocate for such a turn.

Concluding remarks

In this paper, I endeavor to propose a nuanced understanding of ethics within the contemporary socio-technical landscape, advocating for a philosophical approach to technology that challenges the deterministic tendencies prevalent in the field. Initially, I delineate the intricate interplay between technological determinism and ethical considerations, subsequently elucidating an alternative paradigm for synthesizing ethics and technology drawing from the works of Langdon Winner, Peter-Paul Verbeek, and Andrew Feenberg. Central to this discourse is the examination of the role of "experts" within each paradigm, given their pivotal function in imbuing technical artifacts with societal values. Notably, I posit that a reconceptualization of the expert is imperative, as evidenced by my exploration of the political commons tradition and open-source technologies. By envisioning experts as akin to specialized users engaging collaboratively with lay counterparts in design processes, a community ethos infused with norms, values, and morality emerges, fundamentally shaping technological designs.

Furthermore, I underscore the deliberate selection of ethical theories such as those proposed by Jonas and Pelluchon, emphasizing their robustness in accounting for technological dimensions. My aim is to bolster the sophisticated ethical frameworks of these thinkers (meaning Jonas and Pelluchon) by aligning them with a philosophy of technology (Verbeek – Feenberg) that not only scrutinizes the design process but actively integrates moral considerations into it, rather than merely offering post hoc ethical assessments. I advocate for an approach that democratizes design processes, thereby redefining the roles of experts, corporations, funders, and researchers within a broader socio-technical context. The incorporation of Pelluchon's anthropological insights and the epistemological nuances of the "gourmet cogito" represent promising avenues for revitalizing ethical discourse.

Moreover, I contend that the materialization of morality can be facilitated through the cultivation of open-source technologies, which foster inclusive collaboration between diverse stakeholders. By leveraging the affordances of open technologies, ethical theories such as the ethics of care and consideration can be concretely instantiated, transcending the limitations imposed by ostensibly autonomous technological trajectories. I posit that this integrative approach, which amalgamates ethical theories with moralized design processes, holds the potential to catalyze political, ethical, and epistemological transformations within society, echoing Feenberg's vision of co-constructing technology and society. Crucially, this necessitates a paradigm shift towards opening up the black box of technology, whether through in-design methodologies or the cultivation of digital commons, thereby enabling the cultivation of a robust ethical framework capable of addressing emergent technologies such as artificial intelligence, medical advancements, and environmental innovations.

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Giannis Perperidis
Adjunct Lecturer
History Department
Ionian University
johnperpe@gmail.com